

2018

New York and Vermont Corn Silage Hybrid Trials

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Cornell **CALS**
College of Agriculture and Life Sciences



NEW YORK and VERMONT CORN SILAGE HYBRID EVALUATION PROGRAM

2018

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NEW YORK and VERMONT CORN SILAGE HYBRID TESTS – 2018

The corn silage hybrid evaluation program expanded to 77 hybrids in 2018. Hybrid evaluation at multiple environments helps in decision making and expands the reach of this type of data to more farmers. With this in mind Cornell, UVM, and seed companies collaborate to bring this robust evaluation. This year, hybrids were either entered into the 80-95 day relative maturity (**RM**) group (Early-Mid) and were tested at two locations in NY (n = 20; Hu-Lane Farm in Albion and the Willsboro Research Farm in Willsboro) and one location in VT (n = 20; Borderview Farm in Alburgh) or were entered into the 96-110 day relative maturity group (Mid-Late) and were tested at two locations in NY (n = 57; Greenwood Farms in Madrid and the Musgrave Research Farm in Aurora) and one location in VT (n = 55; Borderview Farm in Alburgh). The average Growing Degree Days (**GDD**; 86-50°F system) from May through August for years 2005 to 2018 is 2053 GDD at Albion, 2039 at Willsboro, 1979 at Alburgh, 2078 at Aurora and 1953 at Madrid (Table 1a and 1b).

The NY and VT corn silage evaluation program is made possible with support from dairy producers, participating seed companies, Cornell University, the University of Vermont, the New York Farm Viability Institute, the Northern New York Agricultural Development Program, and the New York State Agricultural Experiment Station. Seed companies were invited to submit hybrids into either maturity group for a fee.

MATERIALS AND METHODS

All hybrids were planted using a two-row planter at 34,000 plants/acre. Each plot consisted of four 20' rows spaced 30 inches apart with harvest of the inner two rows. The following information is shown in Table 2. The early-mid hybrids were planted in Albion, NY on May 10th, in Alburgh, VT on May 18th, and in Willsboro on May 24th. The mid-late hybrids were planted in Madrid, NY on May 9th, in Alburgh, VT on May 17th, and in Aurora, NY on May 26th. Hybrids were planted in a randomized complete block design, with 3 replications. The Albion, NY site has an Appleton silt loam soil type, was previously planted with soybeans and received 32 units N/acre at planting and an additional 120 units N/acre was applied as sidedress. The Willsboro, NY site has a Stafford fine sandy loam soil type, was previously fallow, received 15 units N/acre at planting and 90 units N/acre were applied as sidedress. Both Alburgh, VT sites have a Benson rocky silt loam soil type, were previously planted with corn and a winter rye cover crop and received 5 units N/acre at planting. Additionally, 92 units N/acre were applied as sidedress at both VT locations. The Aurora, NY site has a Lima silt loam soil type, was previously planted with soybeans, and received 25 units N/acre at planting and an additional 106 units N/acre were applied as sidedress. The Madrid, NY location has a Hogansburg loam soil type, was previously planted in sod and received 38 units of manure N/acre prior to planting with an additional 32 units N/acre at planting. The Madrid site did not receive sidedress N.

The early-mid hybrids were harvested on Aug. 28th in Albion, Sept. 12th in Alburgh, and Sept. 14th in Willsboro. The mid-late hybrids were harvested on Sept. 12th in Madrid, Sept. 12th in Alburgh, and Sept. 19th in Aurora. From planting to harvest, the early-mid hybrids had 2148 GDD in Albion, 2134 GDD in Alburgh, and 2196 GDD in Willsboro (86-50 system). From planting to harvest, the mid-late hybrids had 2249 GDD in Madrid, 2271 GDD in Alburgh, and 2245 GDD in Aurora (86-50 system).

The goal was to harvest all hybrids at about 65% ($\pm 3\%$) moisture. The maturity groups were monitored and harvest decisions were made by measuring whole plant dry matter (**DM**) testing on fill plots prior to harvest. Plots were harvested with a two-row, Kemper rotary head and Wintersteiger

Weighmaster system with sample mixing capabilities at a target cutting height of 6 to 8 inches at the Albion, Aurora, and Madrid locations. Plots were harvested with a John Deere 3975 pull-type forage harvester equipped with a custom built 20A Plot Harvester Sampler (RCI Engineering, Mayville, WI) and electronic load cells at the Willsboro location with plot weights determined from the RCI software computer interface on-board the tractor at a target cutting height of 6 to 8 inches. In Vermont, plots were harvested with a John Deere 2-row chopper into a wagon equipped with an Avery Weigh-Tronix weighing system at a target cutting height of 6 to 8 inches.

An approximate 500 g sample was taken in duplicate per plot replicate, resulting in 18 samples per entry across the three sites. Samples were sealed in gallon-sized freezer bags and placed in a chest freezer with the addition of ice packs for transportation back to Cornell University or the University of Vermont where they were transferred to a -20°C freezer and/or shipped for immediate analysis. One of the duplicate samples from each plot was kept as a retained sample while the other sample (9 samples/hybrid entry across the three sites) was submitted to Cumberland Valley Analytical Services (Waynesboro, PA) where NIR procedures were used to determine crude protein (**CP**), starch, lignin, ash, total fatty acids (**TFA**), ash corrected neutral detergent fiber (**aNDFom**), neutral detergent fiber (**NDF**) digestibility (**NDFD**; 12, 30, 120, 240 h), and undigested NDF (**uNDFom**; 240 h). Several companies paid an additional fee for wet chemistry analysis on NDFD at 30 h.

In 2016, we introduced a new concept for evaluating the impact of varying nutrient and digestibility characteristics of corn silage hybrids by utilizing the Cornell Net Carbohydrate and Protein System (CNCPS). Using version 6.55, results from 2016 showed a large range in predicted milk yield values based upon large predicted differences in feed intake of cows fed the example ration among the hybrids. With further understanding of the role of undigested NDF ($uNDF_{240}$) and an ability to now look at potential differences in feed intake based upon predicted rumen pools of aNDFom and $uNDF_{240}$, we chose to utilize CNCPS v. 7.0 for the 2017 and 2018 analysis.

Corn silage hybrid performance was evaluated by the predicted milk production output of the Cornell Net Carbohydrate and Protein System (**CNCPS** v.7.0; Cornell University, Ithaca, NY). Rumen fill dictates the amount of feed a cow can consume and is limited by either the amount of $uNDFom$ or aNDFom in a ration. There is a direct correlation between dry matter intake (**DMI**) and milk production. Therefore, by limiting the amount of feed consumed, the cow's milk production potential is limited. Corn silage chemistry results were applied to a typical New York high corn silage-based diet (forage at ~60% of diet DM; corn silage ~70% of forage DM) in the CNCPS. For practical purposes, since the samples had not undergone fermentation, a feed library value was assigned to soluble protein, ammonia, volatile fatty acids, and 7-hr starch digestibility values. The base diet was formulated by Dr. Tom Overton, Dr. Van Amburgh, and Michael Dineen. Initially, each individual replicate replaced the base corn silage in the diet at the same DM amount. Subsequently, DMI of the entire ration was adjusted based on the first limiting rumen fill factor; 1) the rumen aNDFom pool size or 2) the rumen $uNDFom$ pool size and the predicted milk production was recorded. This novel approach to hybrid evaluation allows us to account for differences in DMI potential of the total ration based upon hybrid selection and is a more biologically robust representation compared to evaluating hybrids on a constant DMI basis. The predictions made by the CNCPS v.7.0 were used to evaluate differences in intake potential and subsequent predicted allowable milk yield based upon the nutrient and digestibility characteristics of each hybrid.

Data were analyzed using PROC GLM in SAS 9.4 (SAS Institute, Cary, NC). The least significant difference (**LSD**) values reported for separating hybrid means for each location were generated at the

$P=0.10$ level. For interpretation purposes, if the difference between two hybrids is greater than the reported LSD, there is a 90% probability that this is not due to random variation and there is a true varietal difference between the hybrids.

RESULTS AND DISCUSSION

The growing season was defined by below average precipitation and above average heat (measured as GDD's) across the region (Table 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 GDD accumulation throughout the season and particularly as the crop neared maturity resulted in fast dry down of the crop to target whole plant moisture content for silage harvest. A noticeable characteristic at harvest in many corn fields, including trial fields, was a healthy green plant with a dry ear.

While nutrient inputs at all locations met or exceeded crop needs, a lack of soil moisture may have compromised nutrient uptake at varying stages of crop development. Recognizing these real world influences and how a hybrid might perform under varying stressors is important to understand when evaluating this data.

Growing Conditions

Albion

Rainfall throughout the growing season (May – August) was below average, resulting in a total deficit of 4.35 inches for those four months. The crop showed drought related stresses through the middle of the growing season. However, rainfall in late July and August (while still below average) arrived at a key time to improve pollination and resulted in overall good ear development.

Growing degree day accumulation was well above average in May, July and August; and near average in June. The result of these growing conditions was below average plant stature with average to above average ears.

Willsboro

For the months of May through July the site received approximately 63% of average rainfall with the largest deficit in July (Table 1a). In August rainfall was 98% of average and September was the only month with above average rainfall. Growing degree day accumulation was above average in May, July, August and September, while June was slightly below average. A late May planting date resulted in this crop not benefiting from the above average heat in May. These factors led to a later tasseling date which meant that rainfall arrived in time to facilitate pollination (Figure 1d).

This field was fallow and defined as a low maintenance grass sod prior to trial implementation. The composition of the sod may not be considered a well maintained sod as defined for sod Nitrogen (N) credits found in the Cornell Nitrogen Guidelines for Field Crops in New York (<http://nmsp.cals.cornell.edu/guidelines/nutrientguide.html>). In addition to the expectation of limited sod N credits the site received sidedress N (Table 2) based on management observations at the location.

Alburgh

This location was below average in rainfall throughout the growing season. The week following planting coincided with a number of cold nights combined with cold rainfall which had an apparent

impact on germination and emergence. While the total seasonal rainfall was slightly higher than the Albion location and very similar to the Willsboro location, this location experienced the largest deviation from average with total rainfall for May to August measuring only 60% of average (Table 1a, 1b). Additionally, there was no significant rainfall from early July to early August and 64% of August rainfall came in one storm event on August 9th (Figure 1a). In this case, the impact of the timing of the rainfall may have been more significant than the below average totals.

Following the trend seen at all 2018 locations, GDD accumulation was above average in all months except for June (Table 1a, 1b). As all hybrids in the 80-95 and 96-110 day relative maturity range were planted at this location, harvest was split to target 35% DM at harvest for each RM group with the first harvest taking place September 12th and the second harvest taking place September 19th (Table 2).

Aurora

Aurora received the highest total precipitation of any location in 2018 with rainfall totals actually slightly above the long term average; however, these numbers are quite deceiving. The location experienced early season drought stress similar to other 2018 locations. The difference was significant storm events in late July and early August that inflated monthly and seasonal totals (Figure 1b). As with other locations, the timing of the rain events had a significant impact on crop development.

Across the location, plant size can be described as below normal in both height and stalk size. Kernel development was compromised in the tip of ears (poor tip fill). This was uniform across the plot and not specific to any one hybrid. There was minor hail damage, also uniform across the plot, resulting from a storm event in late July.

This was the latest planted location in the trials; however, despite being planted 9 days after the Alburgh location, it was harvested on the same date (Table 2) at a higher whole plant DM. Similarly, this location was planted 16 days after Madrid but harvested only 7 days later, again at a higher whole plant DM. While GDD accumulation is an obvious driver of this and was above average at all three locations, the Aurora location actually had the smallest deviation from the long term average. It is likely that the leaf damage caused by the hail event and other growing conditions played a role in the rate of dry down.

Despite the issues with tip fill, a combination of suitable ear development, crop stage at harvest and smaller statured plants resulted in the average percent starch at this location being the highest of the three 96 – 110 day relative maturity locations (Aurora, Madrid, Alburgh).

Madrid

Precipitation and GDD totals followed similar trends to other locations (Table 1a, 1b). Above average rainfall in August can be largely attributed to one significant rain event (Figure 1c). The crop could be described as taller corn with average ears. Like Aurora, tip fill was poor across the plot. An additional stressor that was uniform across the plot was damage from spider mites (*tetranychus urticae* Koch). This pest is often associated with hot weather and drought stressed corn which are consistent with conditions at this location.

Average starch content was notably lower at this location and can be attributed to many of the same factors discussed for the Aurora location. While the factors are the same, their impact differed as this location can be characterized by larger plants relative to ear size and a lower average whole plant DM at harvest.

Forage Quality and Yield

Results are presented in Tables 3 and 4 for each trial location. The tables provide yield and forage quality (CP, aNDFom, starch, lignin, 30 hr NDFD, 240 hr uNDFD, predicted milk yield, etc.) results for each hybrid entry. Overall, compared to challenging feed quality in 2017, the above average GDD accumulation combined with dry conditions early followed by timely rainfall for ear development resulted in overall improvements in starch levels and fiber digestibility, though the degree of change varied by hybrid.

The amount of corn silage included in a dairy cow's diet is largely driven by the total amount and digestibility of the fiber, with respect to the rest of the diet. In developing the CNCPS ration to evaluate 2018 corn silage, it was determined that improved fiber characteristics would allow for a higher corn silage inclusion rate than was possible in 2017 (Figure 2). As a result, an average of 3.5 lbs more corn silage (24.8 lb DM) was included in the formulated ration for a cow producing 100 lbs/day of milk, which was an average of 15 lbs/day more milk than 2017.

Figures 4 and 5 show the crop yield plotted against the predicted milk yield (PMY). The axes are presented as a percent (%) of plot mean with 100% representing the plot mean. From these plots, you can derive the percentage above or below the mean that a given hybrid performed. Each scatterplot is split into four quadrants using the plot mean for the respective parameters to divide the quadrants. This graphical representation provides a quick reference of which quadrant each hybrid falls into at each location; 1) above average in yield and below average in PMY, 2) above average in crop yield and PMY, 3) below average in both crop yield and PMY, 4) below average in crop yield and above average in PMY (Figure 3). It is important to view the data in this context as the performance of a hybrid relative to its peers at the same location is more important than the absolute value for crop yield or PMY. The plot means for crop yield (tons/acre at 35% DM) and PMY (lbs/day) as well as the minimum and maximum values are reported to provide context to the percentages.

When evaluating trial data for corn silage hybrids, two approaches are often used. One method of evaluating hybrids is to study hybrid performance at a location that is most closely related to the growing conditions you experienced on your own farm in 2018. Since conditions at a given location can vary greatly from season to season this is a less desirable method of evaluation.

A second, preferable method for picking desirable hybrids is to look for hybrids that perform consistently above average across trial locations, as this may reflect varying growing conditions more so than the first method. The actual yield or quality measurement (absolute value) is less important than how a hybrid performed relative to its peers at the same locations (% of plot mean). Hybrids that consistently performed above average across locations in both crop yield and PMY (Figures 4 and 5) is a strong indicator of performance. With that said, there was only one hybrid in the trial that performed above the plot mean at all three locations they were entered, which speaks to the variability in growing conditions experienced in 2018.

In the 96-110 day relative maturity range Pioneer 0414AM performed above average for both parameters at all three locations. There were also a small number of hybrids that performed above average for both parameters in two of the three locations; Hubner H4062RC2P, Local Seed ZS8926-VIP3111, Dekalb DKC44-80RIB in the 80-95 day relative maturity range and Doeblers 4018AMXT, Channel 202-81STXRIB, Dairyland HiDF-3202P, Growmark FS53R85SS, Dekalb DKC54-40RIB, CROPLAN 4549, Dyna-Gro D49VC70 in the 96-110 day relative maturity range.

It may not always be desirable to select a hybrid that falls into the second quadrant in Figures 4 and 5 (above average in yield and PMY). Instead, selecting a range of hybrids may be beneficial to accommodate feeding a range of cow groups. As an example, with respect to other forages available for the diet, it is often not favorable to feed a highly digestible corn silage to heifers or dry cows as this may cause over conditioning due to the cow consuming too much energy as a result of an increase in DMI. However, the difference in PMY results between 2017 and 2018 demonstrates the importance of growing digestible forages as an approach to reduce non-forage feed costs and non-forage feed inclusion rates. Environmental conditions strongly influence the forage quality; however, selecting hybrids that have performed well under varying conditions may improve your chances of having a more digestible forage compared to other hybrids grown under the same conditions. We suggest working with your agronomist and nutritionist to identify hybrids that would succeed for your farm and meet your nutritional needs.

CONCLUSIONS

Growers can use this performance data to better understand how a hybrid performs under a diverse set of environments. From this you can compare to your own yearly performance to better understand if a hybrid may be a good fit for your farming conditions.

Overall, all locations used for the 2018 trials experienced dry and warm conditions, which was representative of the growing season across the region yet, the trial results underline the highly variable growing conditions for the individual locations. These conditions and trial results suggest that producers should expect improved feeding characteristics in their 2018 crop when compared to 2017.

The results of this study will be published by PRO-DAIRY (<https://prodairy.cals.cornell.edu/>), Cornell Field Crops (www.fieldcrops.org), and the University of Vermont Extension (www.uvm.edu/extension/cropsoil) and disseminated widely across the region using multiple electronic and print publications.

ACKNOWLEDGEMENTS

We thank the seed companies that participated in 2018 for their collaboration. We urge all seed companies to participate in our corn silage testing program in 2019 so we can provide the best information under New York and Vermont growing conditions to our dairy producers.

We thank Greenwood Dairy and Hu-Lane Farms for their ongoing collaboration and support of the program; Paul Stachowski and Jeff Stanton at the Cornell Musgrave Research Farm, Aurora; Mike Davis, Adam Seyward and Delvin Meseck at the Willsboro Research Farm and Roger Rainville at Borderview Farm for their efforts during field operations; and Andrew LaPierre and Rodrigo Molano for assistance with the CNCPS data analysis.

Additional financial support was provided by New York Farm Viability Institute, Northern New York Agricultural Development Program, New York Corn Growers Association and the Cornell University Agricultural Experiment Station.

Table 1: Comparisons of 2018 growing conditions at trial locations in New York and Vermont.

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	2.13	3.94	2.05	2.66	2.27	3.47	349	316	436	314	372	315
June	2.58	4.89	1.61	3.39	3.23	4.64	426	471	474	491	453	480
July	2.63	4.53	2.36	3.93	2.00	3.83	674	621	720	643	697	644
August	3.33	4.36	3.03	3.43	3.42	3.48	646	572	699	604	689	600
September	3.86	4.02	2.79	3.14	3.52	3.04	431	388	502	418	448	411
May-August	10.67	17.72	9.05	13.40	10.92	15.43	2094	1979	2328	2053	2210	2039
May-September	14.53	21.74	11.84	16.54	14.44	18.46	2525	2367	2830	2471	2658	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	2.13	3.94	2.14	3.00	1.76	3.31	349	316	414	336	364	305
June	2.58	4.89	2.74	3.96	2.60	4.47	426	471	439	495	423	470
July	2.63	4.53	5.01	3.62	3.43	4.71	674	621	660	646	684	609
August	3.33	4.36	4.85	3.72	4.63	4.15	646	572	659	601	652	568
September	3.86	4.02	4.13	3.60	3.17	3.85	431	388	471	416	432	385
May-August	10.67	17.72	14.74	14.31	12.42	16.64	2094	1979	2170	2078	2123	1953
May-September	14.53	21.74	18.87	17.91	15.59	20.50	2525	2367	2641	2494	2554	2337

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

Table 2. NY & VT Corn Silage Trials, Field Information, 2018 Growing Season

	80 - 95 Day Relative Maturity			96-110 Day Relative Maturity		
	Alburgh, VT	Albion, NY	Willsboro, NY	Alburgh, VT	Aurora, NY	Madrid, NY
Planting Date	18-May	10-May	24-May	17-May	26-May	9-May
Harvest Date	12-Sep	28-Aug	14-Sep	19-Sep	19-Sep	12-Sep
Previous Crop	Corn / Rye	Soybean	Fallow	Corn / Rye	Soybeans	Sod
	Cover Crop			Cover Crop		
Starter N	5	32	15	5	25	32
Manure N	0	0	0	0	0	38
Sidedress N	92	120	90	92	106	0
Total Fertilizer N	97	152	105	97	131	70
Soil Type	Benson	Appleton	Stafford	Benson	Lima	Hogansburg

Figure 1. Accumulation of Growing Degree Days (GDD) from planting through harvest and individual rainfall events from May 1st through harvest at Alburgh, VT (1a), Aurora, NY (1b), Madrid, NY (1c), Willsboro, NY (1d), Albion, NY (1e).

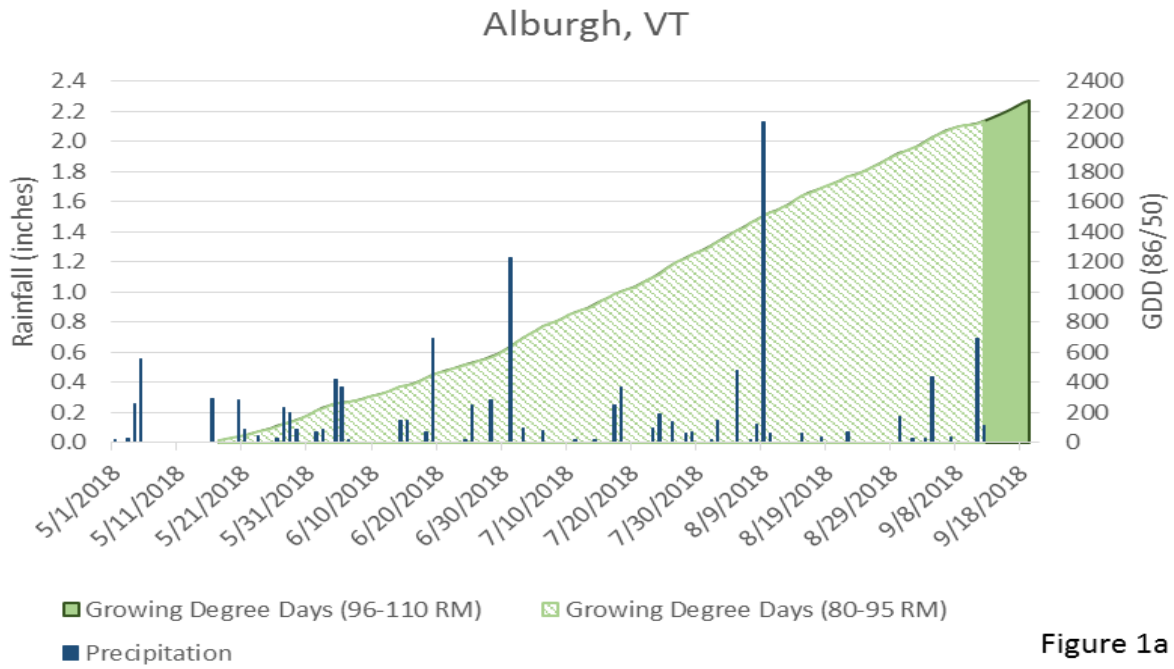


Figure 1a

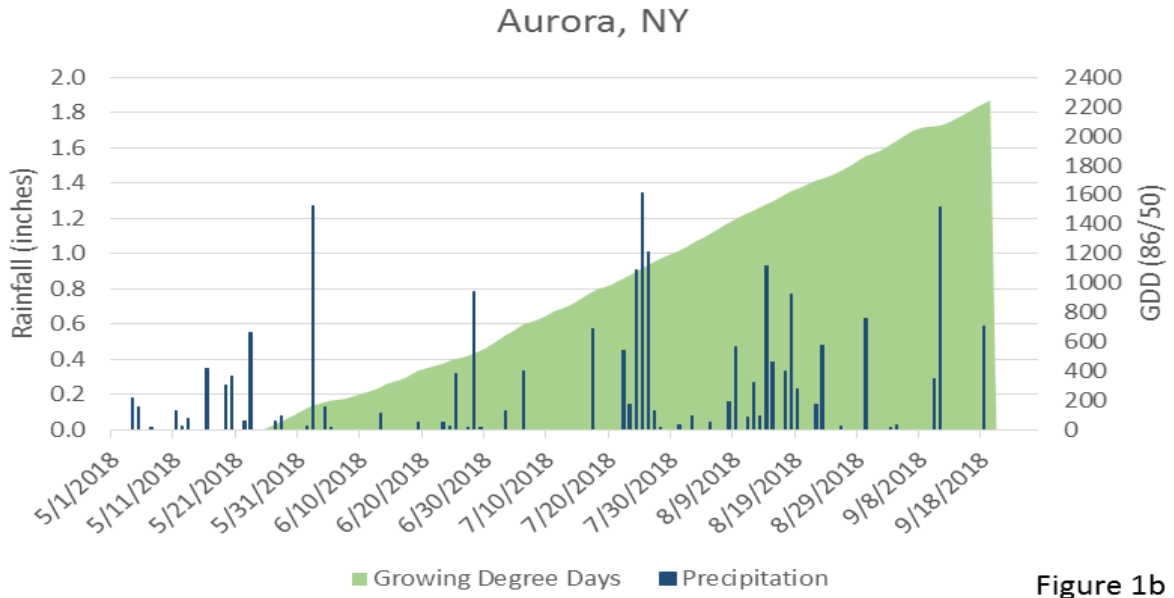


Figure 1b

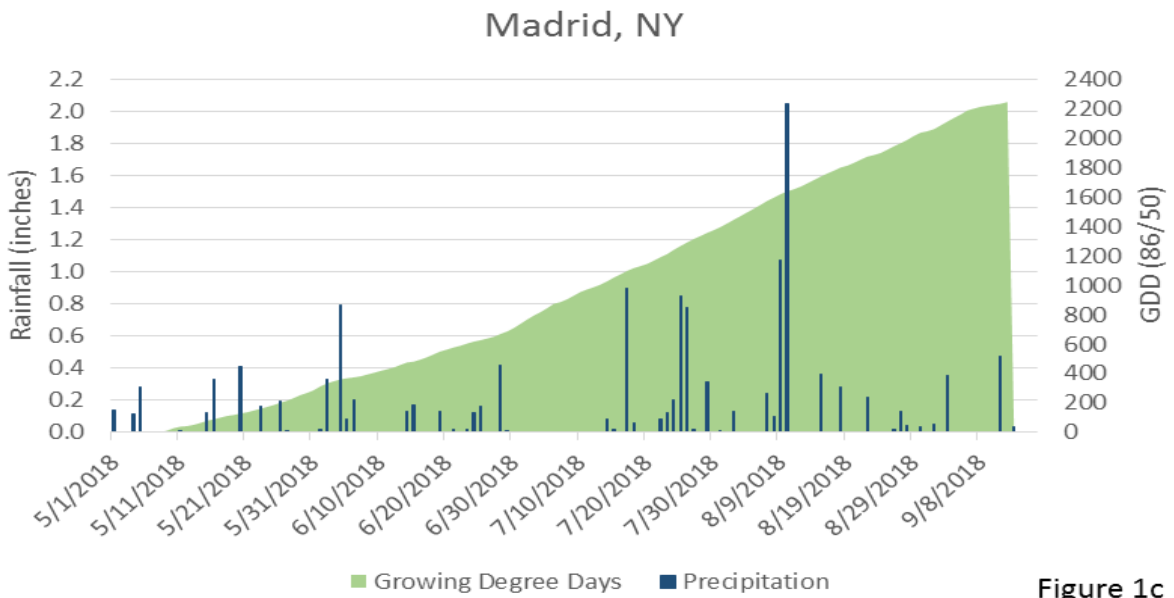


Figure 1c

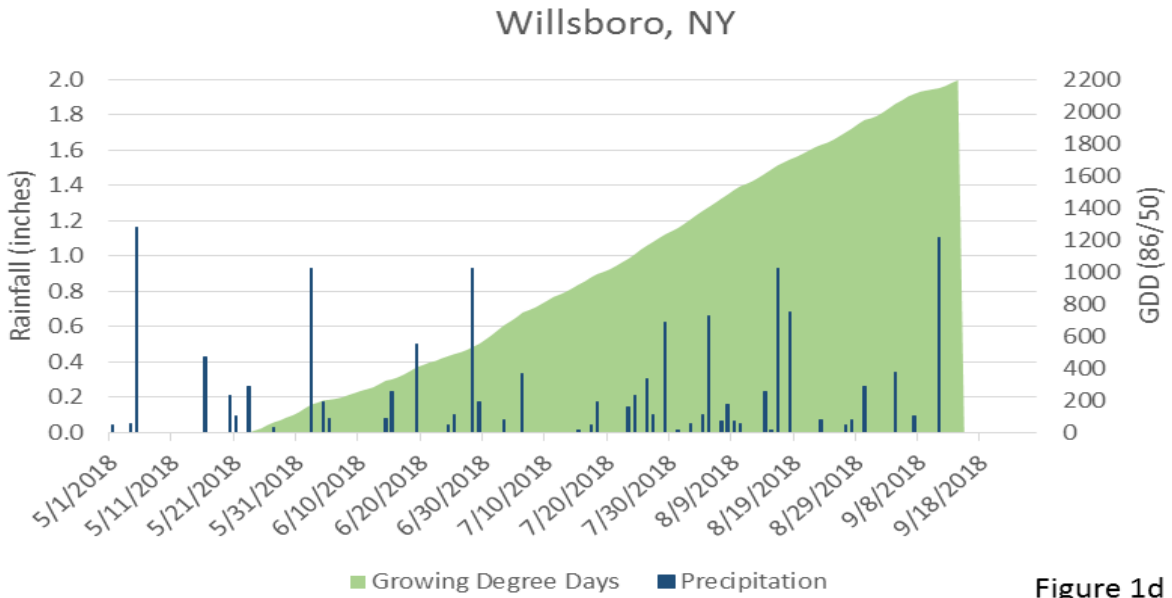


Figure 1d

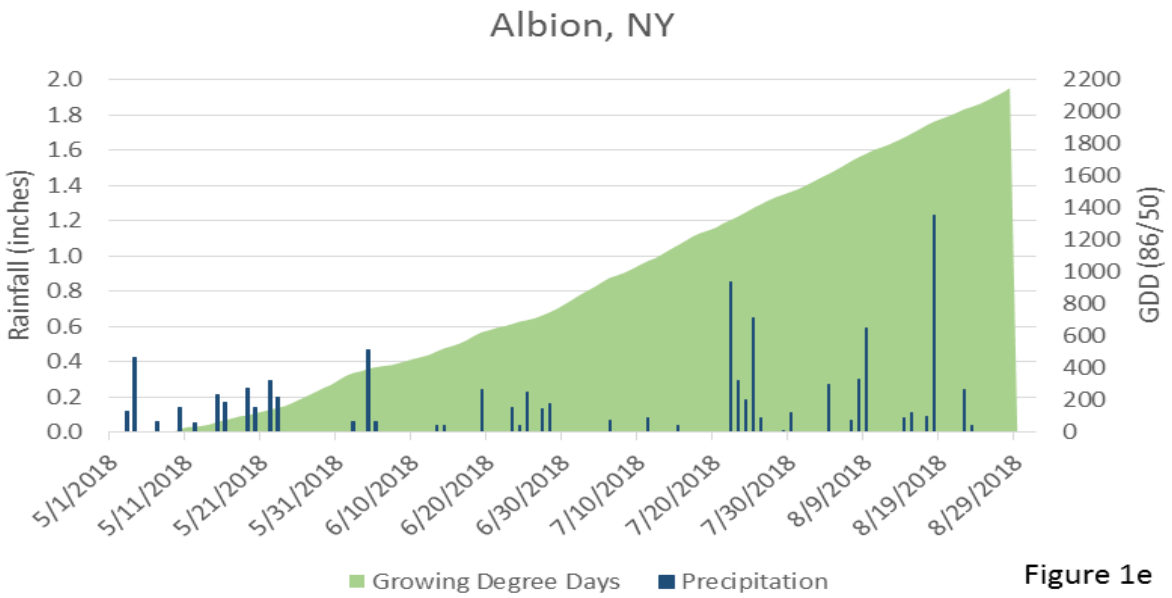


Figure 1e

Figure 2: Comparison of the proportion of samples at different aNDFom (2a) and uNDF240om (2b) levels between 2017 and 2018.

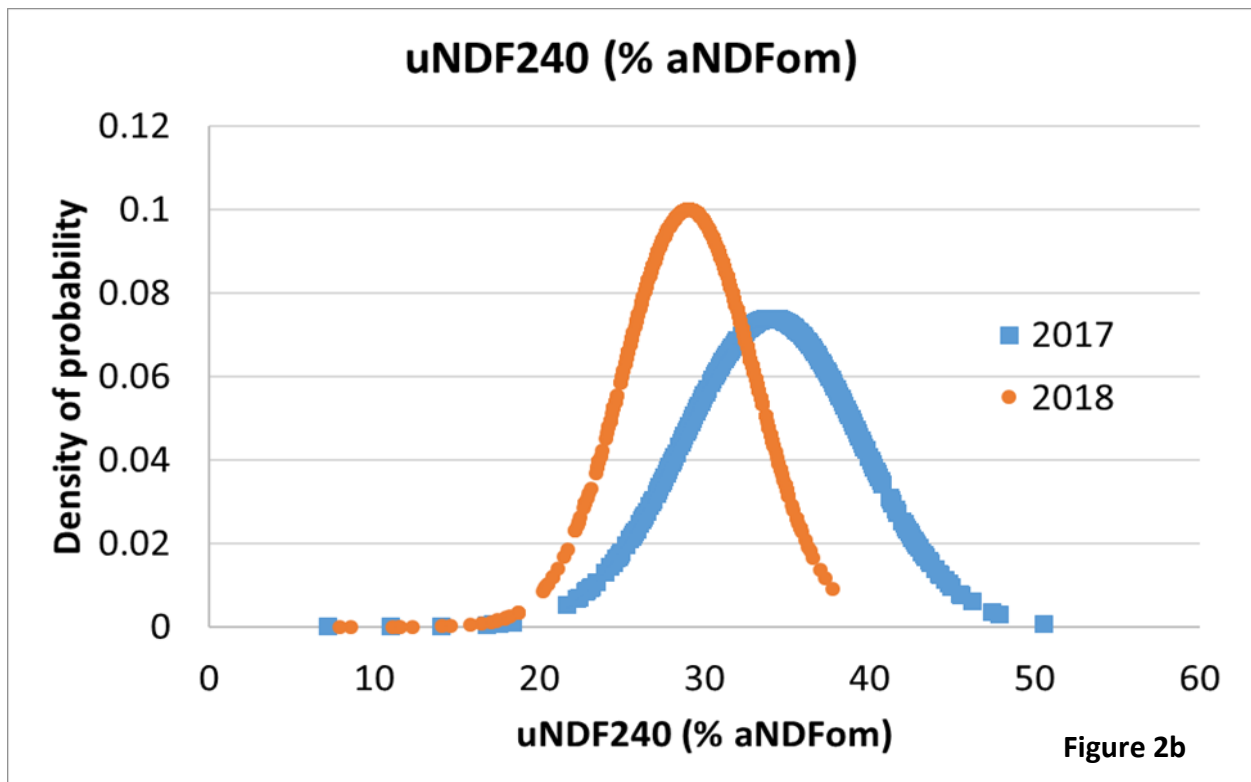
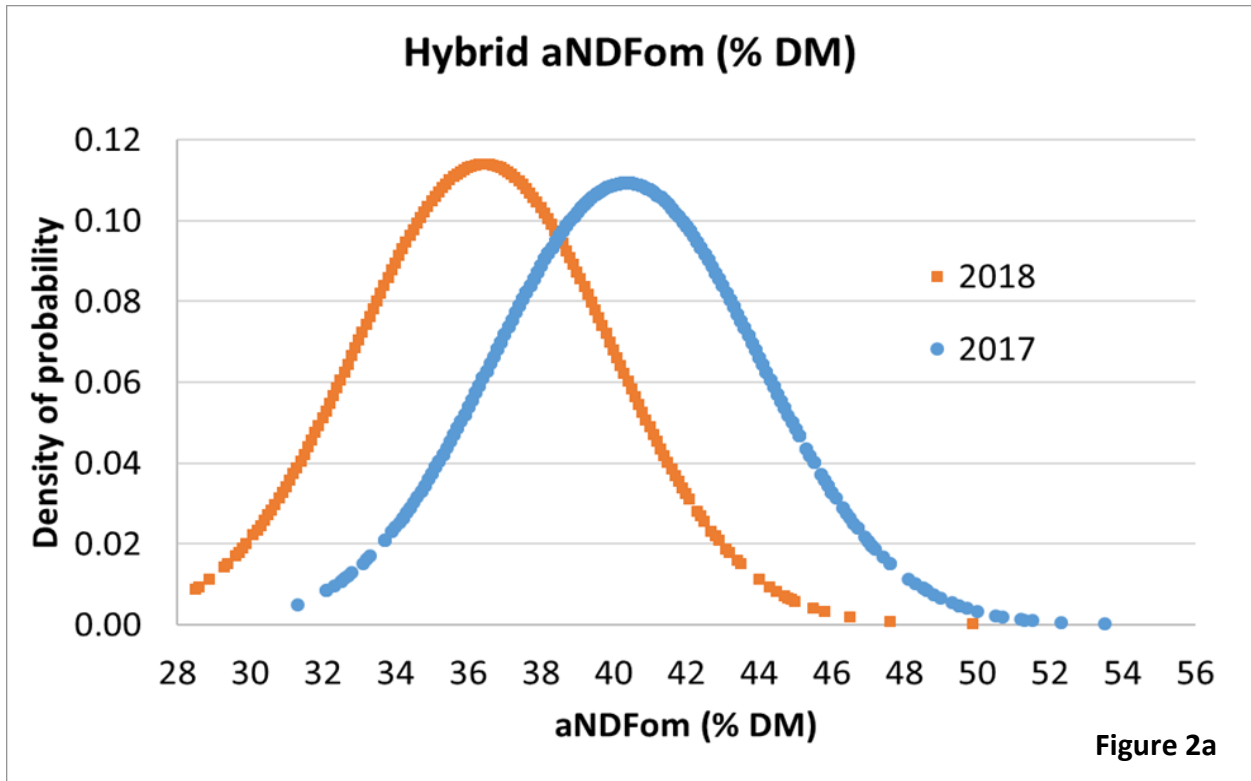


Table 3:

Hybrid field and forage quality data for 80-95 day relative maturity (RM) hybrids planted at Albion, NY (3a), Willsboro, NY (3b) and Alburgh, VT (3c). Hybrids are sorted by dry matter content at harvest.

Table 4.

Hybrid field and forage quality data for 96-110 day relative maturity (RM) hybrids planted at Alburgh, VT (4a), Madrid, NY (4b), Aurora, NY (4c). Hybrids are sorted by dry matter content at harvest. Note: Two hybrids were not entered at the Alburgh, VT locations: Mycogen BMR06B58 and Mycogen BMR10B27.

Footnotes for Tables 3 and 4.

* All nutrient parameters analyzed by NIR methods, except where indicated. Select companies opted to receive wet chemistry information for an additional fee.

** Tables are sorted by descending dry matter for comparison purposes

*** NDF = neutral detergent fiber, aNDFom = ash corrected neutral detergent fiber, NDFD = neutral detergent fiber digestibility, uNDF = undigested neutral detergent fiber

¹ RFC-Fill Ratio = Rumen Fermentable Carbohydrate - Fill Ratio, defined as $((\text{NDFd30} + \text{starch})/\text{uNDF30})$. Jones, L.R., and J. Siciliano-Jones. 2015. Index useful for ranking silage samples. Feedstuffs 17, 19.

² NS = Not Significant

³ One plot replicate had a harvest population count < 25,000

⁴ Yield data removed due to 2 plot replicates having missing yield data during harvest

⁵ Yield and harvest population data removed due to 2 plot replicates having a harvest population count < 25,000

[†] See Table 5: Trait Key

Note: The following companies paid an additional fee for laboratory analysis of NDF Digestibility at 30 hours (NDFD30) by wet chemistry; Augusta Seed, Dairyland, Doeblers, Dyna-Gro, Growmark FS, Hubner Seed, Mycogen, and Syngenta NK. At the time of publication, laboratory work was on going for analysis and an updated report will be released as soon as that is complete.

Table 3a: Hybrid traits and performance for 80 – 95 day RM groups at Albion, NY.

Company/Brand	Hybrid	Trait Code †	Relative Maturity	Harvest	Dry	Yield,	Starch	Crude	Lignin	Ash	Total	aNDFom	NDF	12 hr NDFD	Wet Chem	30 hr NDFD	30 hr NDFD	120 hr NDFD	240 hr NDFD	240 hr uNDFom	RFC - Fill	CNCPS v. 7.0	CNCPS v. 7.0
				Population	Matter	35% DM		Protein			Fatty Acids				Ratio ¹						Predicted Allowable Milk Yield	Predicted Dry Matter Intake	
				plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% NDF	% NDF	% NDFom	% NDFom	% NDFom	% DM		lbs/day	lbs/day
Syngenta NK	NK9227-3220A	20	92	33167	33.6	18.6	38.3	8.5	2.5	3.5	2.8	34.5	35.0	38.4		56.0	68.6	70.0	10.4	3.7	106.9	61.5	
Syngenta NK	NK8920-3120	18	89	35833	34.3	18.8	36.8	8.6	2.6	3.5	2.6	36.1	36.6	37.6		55.2	67.6	69.1	11.2	3.5	102.2	59.9	
Channel	192-98VT2PRIB	42	92	32167	34.4	21.7	37.9	8.8	2.4	3.5	2.7	34.6	35.1	38.8		56.4	69.5	71.0	10.0	3.8	107.8	61.9	
Seedway	SW3654RR	2	91	35333	36.4	20.1	39.7	8.0	2.2	3.4	2.5	34.7	35.2	41.0		60.2	72.9	74.4	9.0	4.3	114.7	64.5	
Growmark FS	FS 42R88VT2P	41	92	33500	36.4	22.2	39.3	8.2	2.5	3.5	2.9	34.5	35.1	38.7		56.0	68.8	70.3	10.3	3.8	106.7	61.3	
Dekalb	DKC40-77RIB	36	90	36000	37.1	17.9	41.0	8.0	2.4	3.2	2.9	33.6	34.1	37.8		55.6	68.3	69.8	10.2	3.9	108.1	61.7	
Local Seed Company	LC9278 SXRIB	36	92	36333	37.2	18.6	40.8	7.8	2.3	3.2	3.0	33.6	34.2	39.8		58.1	70.7	72.6	9.3	4.2	113.7	64.0	
Local Seed Company	ZS8926 VIP3111	17	89	31500	38.7	19.6	41.0	8.2	2.5	3.3	3.2	32.0	32.6	36.3		55.3	67.5	68.8	10.1	4.0	109.8	62.4	
Hubner	H4062RC2P	42	86	35167	39.7	18.3	42.8	8.0	2.4	3.0	3.1	31.8	32.3	38.2		56.2	68.1	69.9	9.7	4.3	113.9	63.8	
Dekalb	DKC36-28RIB	36	86	35167	40.1	17.3	41.4	8.1	2.3	3.0	3.0	33.2	33.7	39.0		56.7	68.6	70.4	10.0	4.1	110.8	62.7	
Masters Choice	MCT3891	10	88	32667	40.2	16.4	39.3	8.5	2.4	3.3	2.9	33.2	33.7	38.2		57.1	68.0	69.5	10.1	4.0	111.5	63.1	
86-92 day RM Mean				34258	37.1	19.0	39.8	8.2	2.4	3.3	2.9	33.8	34.3	38.5		56.6	69.0	70.5	10.0	4.0	109.7	62.4	
Dekalb	DKC44-80RIB	42	94	34333	34.1	20.2	42.1	7.6	2.3	3.5	2.9	32.4	32.9	37.7		55.7	69.8	71.8	9.2	4.1	112.2	63.4	
Wolf River Valley	3995FL	48	95	34833	34.4	19.9	29.1	8.4	2.7	3.9	2.2	41.9	42.5	40.5		57.1	70.0	71.7	12.0	2.9	94.5	57.4	
Seedway	SW3600GENSS	36	93	34833	34.5	18.8	36.1	8.3	2.5	3.9	2.7	36.3	36.8	38.7		57.0	70.3	71.5	10.4	3.6	105.0	61.1	
Dekalb	DKC45-07RIB	36	95	35000	34.9	19.9	39.9	8.4	2.3	3.7	2.6	33.1	33.6	38.5		57.4	71.8	73.4	8.9	4.1	113.4	64.0	
Augusta Seed Corp.	A2843 ⁴	16	93	31167	35.0	—	37.3	8.7	2.6	3.5	2.7	34.8	35.3	37.2		55.4	66.5	68.6	11.0	3.6	102.4	59.8	
Dyna-Gro	D35SS58	34	95	35167	35.2	18.5	41.5	8.3	2.3	3.4	2.9	32.6	33.1	39.1		57.5	70.6	72.2	9.1	4.2	114.5	64.2	
Masters Choice	MCT4572	16	95	31667	35.3	20.3	39.6	8.9	2.5	3.6	2.7	33.3	33.8	36.3		54.6	66.6	68.1	10.7	3.7	106.3	61.4	
Seedway	SW3768GENSS	36	95	34000	35.9	20.2	39.1	8.5	2.1	3.5	2.7	33.5	34.0	39.0		59.1	72.7	74.4	8.6	4.2	115.5	64.7	
Pioneer	P9330AM	3	93	34333	36.1	19.0	40.5	8.6	2.3	3.4	2.8	33.5	34.0	40.5		57.8	70.5	72.0	9.5	4.2	112.6	63.6	
93-95 day RM Mean				33926	35.0	19.6	38.4	8.4	2.4	3.6	2.7	34.6	35.1	38.6		56.8	69.9	71.5	9.9	3.8	108.5	62.2	
LSD (0.10)				2880	2.7	NS²	5.1	0.5	0.3	0.3	0.3	NS	NS	1.8		2.3	3.2	3.0	NS	NS	NS	NS	
Overall Mean				34108	36.2	19.3	39.2	8.3	2.4	3.4	2.8	34.2	34.7	38.6		56.7	69.4	71.0	10.0	3.9	109.1	62.3	

Table 3b: Hybrid traits and performance for 80 – 95 day RM groups at Willsboro, NY.

Company/Brand	Hybrid	Trait Code †	Relative Maturity	Harvest	Dry	Yield,	Starch	Crude	Lignin	Ash	Total	aNDFom	NDF	12 hr NDFD	Wet Chem	30 hr NDFD	120 hr NDFD	240 hr NDFD	240 hr uNDFom	RFC - Fill Ratio ¹	CNCPS v. 7.0	CNCPS v. 7.0
				Population	Matter	35% DM		Protein	% DM	% DM	% DM				Fatty Acids						% DM	% DM
				plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% NDF	% NDF	% NDFom	% NDFom	% NDFom	% DM	lbs/day	lbs/day
Syngenta NK	NK9227-3220A	20	92	32960	32.2	20.4	35.5	8.5	2.6	3.2	2.6	34.6	35.4	36.7		60.5	67.5	70.3	10.4	3.9	111.5	63.2
Channel	192-98VT2PRIB	42	92	31654	33.0	17.8	36.4	8.7	2.4	3.1	2.7	34.1	34.7	38.7		63.2	71.5	74.6	8.8	4.5	120.0	66.3
Local Seed Company	LC9278 SXRIB	36	92	34122	33.2	18.2	35.0	7.9	2.4	3.1	2.6	35.9	36.5	39.8		63.7	70.3	73.4	9.6	4.3	117.9	65.6
Syngenta NK	NK8920-3120	18	89	32234	34.3	20.1	32.1	8.4	2.8	3.5	2.4	38.4	39.0	37.4		60.4	67.7	70.7	11.3	3.5	103.2	60.4
Dekalb	DKC40-77RIB	36	90	32525	35.2	18.5	35.2	8.3	2.5	3.2	2.5	35.0	35.6	38.4		63.1	69.9	72.9	9.6	4.3	117.4	65.6
Dekalb	DKC36-28RIB	36	86	33541	35.3	16.5	31.8	8.5	2.6	3.6	2.5	38.9	39.5	40.8		65.0	72.1	75.2	9.7	4.1	113.9	64.6
Seedway	SW3654RR	2	91	32089	35.4	18.1	33.6	8.1	2.7	3.1	2.3	37.9	38.5	39.3		61.9	69.0	71.8	10.7	3.9	108.8	62.4
Local Seed Company	ZS8926 VIP3111	17	89	30492	37.4	18.2	34.6	7.6	2.6	3.0	2.5	36.2	36.9	37.3		61.3	68.2	71.1	10.5	3.9	110.9	62.8
Hubner	H4062RC2P	42	86	32815	37.9	19.3	39.6	7.9	2.4	3.2	2.7	33.2	33.7	40.1		62.2	70.7	73.8	8.7	4.7	121.0	66.7
Growmark FS	FS 42R88VT2P	41	92	32380	37.9	18.3	39.0	7.9	2.2	3.1	2.8	33.4	33.9	40.2		64.3	71.5	74.5	8.6	5.0	124.9	68.2
Masters Choice	MCT3891	10	88	32089	38.4	18.5	37.8	8.3	2.4	2.9	2.8	34.4	35.0	38.7		62.7	69.1	72.0	9.7	4.5	118.2	65.5
86-92 day RM Mean				32446	35.5	18.5	35.5	8.2	2.5	3.2	2.6	35.6	36.2	38.9		62.6	69.8	72.8	9.8	4.2	115.2	64.7
Dekalb	DKC45-07RIB	36	95	31654	32.7	18.2	35.5	8.4	2.3	3.4	2.5	35.1	35.8	40.7		64.9	72.0	75.2	8.7	4.5	122.1	67.4
Seedway	SW3600GENSS	36	93	31073	33.0	17.6	30.8	8.2	2.6	3.4	2.3	37.9	38.8	38.0		64.0	73.1	76.2	9.1	3.8	115.3	65.2
Seedway	SW3768GENSS	36	95	29185	33.9	17.6	34.5	8.5	2.4	3.2	2.5	35.5	36.1	39.1		63.9	69.8	72.7	9.8	4.3	117.6	65.6
Masters Choice	MCT4572	16	95	32815	33.9	19.0	34.8	8.5	2.4	3.1	2.4	33.9	34.8	37.4		63.6	69.4	72.5	9.3	4.3	121.0	66.9
Dyna-Gro	D35SS58	34	95	32089	34.1	16.5	35.4	8.5	2.4	3.3	2.4	35.1	35.8	40.5		64.6	71.5	74.5	9.1	4.5	120.6	66.7
Augusta Seed Corp.	A2843	16	93	27733	34.5	18.4	35.5	8.6	2.6	3.0	2.6	34.1	34.8	37.1		60.7	68.9	71.9	9.7	4.0	112.2	63.2
Dekalb	DKC44-80RIB	42	94	33541	34.5	18.6	36.7	7.4	2.3	3.2	2.4	34.3	35.0	39.9		64.1	72.4	75.5	8.4	4.5	122.6	67.4
Wolf River Valley	3995FL	48	95	31799	35.3	20.2	29.9	8.0	2.8	3.2	2.2	39.5	40.1	37.0		61.1	67.6	70.6	11.7	3.4	101.3	59.7
Pioneer	P9330AM	3	93	32960	38.5	19.2	34.8	7.9	2.6	3.0	2.3	36.8	37.4	38.7		61.4	68.4	71.3	10.6	4.0	110.7	63.0
93-95 day RM Mean				31428	34.5	18.4	34.2	8.2	2.5	3.2	2.4	35.8	36.5	38.7		63.1	70.4	73.4	9.6	4.1	115.9	65.0
LSD (0.10)				2150	1.6	NS²	4.0	0.5	0.3	0.3	0.3	2.9	2.9	1.9		NS	NS	NS	NS	0.6	11.3	4.3
Overall Mean				31988	35.0	18.4	34.9	8.2	2.5	3.2	2.5	35.7	36.4	38.8		62.8	70.0	73.0	9.7	4.2	115.6	64.8

Table 3c: Hybrid traits and performance for 80 – 95 day RM groups at Alburgh, VT.

Company/Brand	Hybrid	Trait Code †	Relative Maturity	Harvest	Dry	Yield,	Starch	Crude	Lignin	Ash	Total	aNDFom	NDF	12 hr NDFD	Wet Chem	30 hr NDFD	30 hr NDFD	120 hr NDFD	240 hr NDFD	240 hr uNDFom	RFC - Fill Ratio ¹	CNCPS v. 7.0	CNCPS v. 7.0
				Population	Matter	35% DM		Protein			Fatty Acids				30 hr NDFD							Predicted Allowable Milk Yield	Predicted Dry Matter Intake
				plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	lbs/day	lbs/day
Syngenta NK	NK9227-3220A	20	92	27733	29.2	15.3	27.8	8.0	3.1	4.1	2.1	39.7	40.2	34.9			57.6	67.1	69.9	12.0	3.0	96.2	58.1
Syngenta NK	NK8920-3120	18	89	30347	32.1	22.0	32.0	7.5	3.3	4.2	2.3	39.3	39.9	33.7			54.0	64.6	67.4	12.9	2.9	90.4	55.8
Channel	192-98VT2PRIB	42	92	29040	32.4	18.2	31.3	7.9	2.8	4.3	2.2	38.6	39.2	37.8			59.3	69.3	72.2	10.8	3.4	103.1	60.7
Local Seed Company	ZS8926 VIP3111 ³	17	89	28024	32.7	21.1	31.3	7.8	3.0	4.1	2.6	37.9	38.5	35.7			56.9	66.6	69.3	11.7	3.2	98.7	58.7
Local Seed Company	LC9278 SSXRIB ³	36	92	25991	33.1	16.8	28.9	7.6	3.1	4.5	2.3	41.0	41.6	37.2			57.8	68.3	71.2	11.9	3.0	95.9	58.0
Growmark FS	FS 42R88VT2P	41	92	28314	33.7	18.1	32.4	8.0	2.8	4.5	2.4	37.6	38.4	37.7			60.1	70.1	73.2	10.1	3.5	106.2	61.7
Dekalb	DKC40-77RIB	36	90	28169	34.0	17.3	31.7	7.5	3.1	4.2	2.2	39.0	39.7	35.7			56.0	66.8	69.6	11.9	3.0	96.3	58.2
Seedway	SW3654RR ³	2	91	28314	34.0	20.3	28.1	7.6	3.1	4.5	1.9	42.2	42.9	36.4			57.5	68.6	71.6	12.1	2.9	92.6	56.8
Dekalb	DKC36-28RIB	36	86	29185	35.2	17.5	32.6	8.1	3.0	4.5	2.5	38.7	39.3	36.8			57.1	67.7	70.7	11.4	3.2	99.1	59.2
Hubner	H4062RC2P ³	42	86	28459	38.0	19.7	35.3	7.3	3.0	4.1	2.5	37.9	38.5	36.1			56.7	67.0	70.0	11.4	3.4	99.0	58.9
Masters Choice	MCT3891	10	88	28604	38.5	20.4	35.3	7.5	3.1	3.7	2.4	37.8	38.4	35.9			55.9	65.3	68.0	12.2	3.4	95.7	57.4
86-92 day RM Mean				28380	33.9	18.8	31.5	7.7	3.1	4.2	2.3	39.1	39.7	36.2			57.2	67.4	70.3	11.7	3.2	97.6	58.5
Wolf River Valley	3995FL	48	95	27588	30.1	15.6	20.2	8.2	3.3	4.7	1.7	45.0	45.7	36.1			58.6	69.1	72.0	12.7	2.4	89.6	56.1
Dekalb	DKC45-07RIB ³	36	95	28895	31.5	19.3	30.3	7.9	3.1	4.9	2.2	38.6	39.4	35.5			57.8	67.8	70.8	11.4	3.1	98.7	59.2
Seedway	SW3600GENSS	36	93	28750	32.0	18.4	31.0	8.1	3.0	4.5	2.2	38.1	38.7	36.3			57.1	67.6	70.4	11.3	3.1	98.9	59.1
Augusta Seed Corp.	A2843 ⁵	16	93	—	32.6	—	29.0	8.1	3.3	4.4	2.2	39.8	40.4	33.5			55.8	65.3	68.0	12.8	2.9	91.1	56.1
Masters Choice	MCT4572	16	95	27007	32.8	18.2	31.9	7.8	3.2	4.0	2.3	38.4	38.9	34.2			55.1	64.7	67.6	12.5	3.0	92.9	56.5
Dyna-Gro	D35SS58 ³	34	95	27733	33.0	16.4	33.2	8.1	2.8	4.5	2.3	35.8	36.7	37.5			60.4	69.5	72.5	9.9	3.7	109.7	63.1
Dekalb	DKC44-80RIB	42	94	28459	33.0	17.8	34.0	7.5	2.8	4.1	2.4	36.7	37.3	37.9			59.0	69.6	72.6	10.1	3.6	106.8	61.8
Seedway	SW3768GENSS ³	36	95	25991	33.6	16.8	32.0	7.9	2.8	4.4	2.3	37.7	38.3	37.1			58.8	69.0	72.0	10.6	3.4	103.3	60.7
Pioneer	P9330AM	3	93	29330	35.8	19.6	31.3	7.3	3.5	4.1	2.1	41.9	42.5	33.4			52.2	63.7	66.4	14.2	2.7	81.8	52.5
93-95 day RM Mean				27969	32.7	17.8	30.3	7.9	3.1	4.4	2.2	39.1	39.8	35.7			57.2	67.4	70.3	11.7	3.1	97.0	58.3
LSD (0.10)				NS²	2.0	2.9	4.9	0.5	0.4	NS	0.3	3.8	3.8	2.6			2.9	2.6	2.8	1.9	NS	12.2	4.4
Overall Mean				28207	33.4	18.4	31.0	7.8	3.1	4.3	2.3	39.1	39.7	36.0			57.2	67.4	70.3	11.7	3.1	97.3	58.4

Table 4a: Hybrid traits and performance for 96-110 day RM groups at Alburgh, VT.

Company/Brand	Hybrid	Trait Code †	Relative Maturity	Harvest	Dry	Yield,	Starch	Crude	Lignin	Ash	Total	aNDFom	NDF	12 hr NDFD	Wet Chem	30 hr NDFD	120 hr NDFD	240 hr uNDFom	RFC - Fill Ratio ¹	CNCPS v. 7.0	CNCPS v. 7.0	
				Population	Matter	35% DM		Protein			Fatty Acids				30 hr NDFD					Predicted Allowable Milk Yield	Predicted Dry Matter Intake	
				plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	lbs/day	lbs/day	
Mycogen	BMR97B37	35	97	36736	32.6	21.2	29.6	7.1	2.8	3.4	2.5	41.3	41.9	40.3		65.4	72.6	75.7	10.1	3.8	110.3	63.2
Wolf River Valley	3900FL	48	100	28024	33.0	23.2	24.2	7.3	3.8	3.7	1.9	45.2	45.9	31.4		53.3	63.2	66.0	15.5	2.3	74.8	49.8
CROPLAN	4004	1	100	30637	33.1	22.5	34.8	6.9	3.1	3.7	2.5	39.5	40.1	35.0		55.4	65.2	67.9	12.7	3.1	91.7	55.9
Albert Lea Viking	O.79-00	1	100	28604	33.3	22.1	38.3	7.3	3.0	3.7	2.6	35.3	35.8	34.7		55.0	64.5	67.2	11.6	3.6	100.0	58.9
Doebler's	4018AMXT	9	100	32525	34.2	19.5	31.1	6.9	3.2	4.3	2.2	41.3	42.0	37.4		57.2	68.5	71.4	11.9	3.0	94.7	57.5
Pioneer	P9998AMXT	9	99	31508	34.2	21.8	35.0	7.6	3.1	4.1	2.5	36.7	37.2	34.9		55.8	65.2	68.0	11.8	3.4	99.1	58.9
Mycogen	F2F499 ³	34	99	30347	34.3	23.8	38.9	7.5	2.4	3.5	2.6	34.2	34.7	40.9		63.7	73.8	77.1	7.9	4.8	122.0	67.2
Hubner	H6225RCSS	36	102	30782	34.5	22.6	33.9	7.0	3.3	3.9	2.4	38.7	39.3	34.3		53.5	64.6	67.4	12.7	3.0	92.3	56.4
Doebler's	3618AMXT	9	96	31508	34.7	22.5	32.3	7.2	3.3	4.5	2.5	40.7	41.3	34.8		55.5	65.9	68.9	12.7	3.0	90.8	56.1
Growmark FS	FS 49R79SS	34	99	30056	34.9	23.7	33.6	7.4	3.3	4.2	2.3	38.5	39.1	33.8		54.4	64.9	67.6	12.5	3.0	90.6	55.7
Masters Choice	MCT4934	17	99	30492	34.9	24.1	32.7	7.3	3.0	4.3	2.2	38.3	38.9	35.0		57.1	67.6	70.5	11.4	3.3	99.4	59.3
Channel	202-81STXRIB	36	102	31508	35.1	21.8	34.3	7.3	3.1	3.9	2.4	39.1	39.7	35.5		56.4	66.2	69.1	12.1	3.2	96.1	57.8
Local Seed Company	ZS9725 VIP3111	17	97	31073	35.2	24.7	36.3	7.1	3.3	3.9	2.9	37.3	37.9	32.9		53.6	63.4	66.1	12.8	3.2	91.6	55.8
Masters Choice	MCT4632	16	96	29911	35.5	19.1	36.0	7.6	3.0	3.9	2.6	35.7	36.2	35.1		55.1	65.5	68.1	11.5	3.4	99.7	58.9
Dekalb	DKC50-09RIB	42	100	31508	35.7	24.3	38.8	7.2	2.8	3.7	2.6	35.0	35.5	36.1		57.2	66.7	69.7	10.7	3.8	106.9	61.5
CROPLAN	3899	42	98	32815	35.8	28.0	32.7	6.9	3.3	4.1	2.3	40.9	41.5	34.8		54.7	65.9	68.7	12.9	2.9	89.9	55.6
Augusta Seed Corp.	A3750	16	100	32380	35.8	21.9	37.2	7.3	2.8	3.6	2.8	35.1	35.7	36.8		57.4	67.2	70.0	10.6	3.8	107.2	61.6
Dekalb	DKC51-40RIB	42	101	32960	36.0	24.2	35.0	6.9	3.1	3.9	2.4	38.6	39.2	35.8		55.6	65.6	68.4	12.3	3.3	95.0	57.2
Doebler's	4115AMXT	9	101	30347	36.4	26.2	35.7	7.1	3.1	3.8	2.2	37.5	38.1	36.5		55.4	67.5	70.5	11.2	3.4	100.1	59.3
Syngenta NK	NK9738-3220	20	97	32380	36.7	26.9	33.3	7.6	3.3	3.7	2.3	38.4	39.0	32.5		53.9	63.6	66.3	13.0	3.0	89.4	55.0
Hubner	H6219RCSS	36	100	33686	36.9	23.1	34.9	7.1	3.1	3.7	2.4	38.0	38.6	36.0		56.3	67.3	70.1	11.5	3.3	100.0	59.2
Channel	197-90STXRIB	36	97	33106	37.0	23.4	33.1	7.0	3.5	4.1	2.2	39.9	40.5	32.7		53.1	63.1	65.7	13.7	2.9	84.9	53.5
Hubner	H6124RCSS	36	96	30637	37.1	22.4	35.9	7.1	3.1	4.2	2.4	37.1	37.7	35.7		54.7	66.3	69.2	11.5	3.3	98.4	58.7
Dairyland	HiDF-3197RA	35	97	31363	37.3	20.5	36.8	7.6	2.9	3.7	2.6	37.4	38.0	38.0		57.2	68.4	71.3	10.9	3.6	103.0	60.2
Dairyland	HiDF-3202P	31	102	34122	37.3	24.5	32.0	7.4	3.1	4.0	2.4	40.0	40.7	36.4		56.9	67.7	70.5	11.9	3.1	96.3	58.0
Augusta Seed Corp.	A2448	20	98	31944	37.7	24.2	36.9	6.9	3.3	3.8	2.5	36.3	36.8	31.8		51.4	61.9	64.4	12.9	3.1	89.8	55.1
Growmark FS	FS 46R77SS	34	96	31508	38.5	22.5	33.6	7.1	3.3	4.1	2.4	39.4	40.0	34.0		53.6	63.6	66.3	13.3	3.0	87.8	54.6
Dekalb	DKC47-27RIB	42	97	29621	39.5	21.7	40.6	7.5	2.9	3.6	2.6	34.0	34.5	35.8		56.9	66.5	69.3	10.5	4.1	107.1	61.5
			96-102 day RM Mean	31503	35.6	23.1	34.6	7.2	3.1	3.9	2.4	38.2	38.8	35.3		55.9	66.2	69.0	11.9	3.3	96.8	57.9
			LSD (0.10)	NS²	2.9	NS	4.8	NS	0.3	0.5	0.3	3.8	3.9	2.6		3.0	3.0	3.1	1.8	0.6	12.0	4.4
			Overall Mean	31347	34.8	23.3	34.2	7.2	3.1	3.9	2.4	38.4	39.0	35.3		55.9	66.0	68.9	12.0	3.2	96.1	57.7

Table 4a: Hybrid traits and performance for 96-110 day RM groups at Alburgh, VT (cont).

Company/Brand	Hybrid	Trait Code †	Relative Maturity	Harvest	Dry	Yield,	Starch	Crude	Lignin	Ash	Total	aNDFom	NDF	12 hr	Wet Chem	30 hr	120 hr	240 hr	240 hr	RFC - Fill	CNCPS v. 7.0	CNCPS v. 7.0
				Population	Matter	35% DM	% DM	Protein	% DM	% DM	% DM	% DM	Fatty Acids	% DM	% DM	% DM	NDFD	30 hr NDFD	NDFD	NDFD	uNDFom	Ratio ¹
				plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% NDF	% NDF	% NDFom	% NDFom	% NDFom	% DM		lbs/day	lbs/day
Channel	210-98STXRIB	36	110	30637	30.8	27.2	31.6	7.1	3.3	3.7	2.2	41.0	41.7	35.3		55.0	65.1	67.8	13.3	2.9	88.9	55.1
Masters Choice	MCT5790	1	107	28750	31.6	22.5	31.2	7.7	2.9	4.3	2.3	39.1	39.7	37.5		59.3	69.3	72.3	10.9	3.4	101.5	60.0
Growmark FS	FS 55R25SS ³	34	105	31073	32.1	24.3	30.0	7.5	3.3	4.5	2.2	40.2	40.8	34.5		55.0	66.2	69.0	12.5	2.8	92.2	56.8
Doebler's	5018AM	3	110	32234	32.2	26.2	32.3	7.3	3.2	4.0	2.3	39.2	39.8	36.3		56.2	67.5	70.4	11.7	3.1	97.0	58.3
Doebler's	4717AMX	8	107	29330	32.8	22.2	35.9	7.5	2.9	3.6	2.4	36.2	36.7	37.3		57.6	68.0	70.8	10.6	3.6	105.3	60.9
CROPLAN	4549	1	105	32234	32.9	21.1	35.1	7.3	3.0	3.9	2.5	37.4	37.9	35.7		57.5	66.5	69.4	11.5	3.5	99.6	58.8
Doebler's	4318AMXT	9	103	30782	33.0	22.4	33.0	7.2	3.2	3.9	2.1	38.7	39.3	34.3		54.8	66.1	69.0	12.0	3.0	94.2	57.1
Albert Lea Viking	O.48-08GS	1	108	32960	33.1	23.7	34.9	7.6	3.1	4.1	2.4	38.0	38.6	34.7		55.6	65.2	68.1	12.2	3.3	95.5	57.5
Seedway	SW6614RR	2	109	32815	33.1	20.2	33.3	7.0	3.5	3.9	2.3	40.0	40.6	33.4		52.4	63.2	66.0	13.7	2.8	85.8	53.8
Dekalb	DKC54-40RIB ³	42	104	31363	33.3	22.1	32.0	6.9	3.4	4.1	2.3	40.3	40.9	32.8		53.6	64.5	67.2	13.4	2.9	88.0	54.7
Channel	209-15STXRIB	36	109	33396	33.4	27.7	37.0	7.5	3.1	3.7	2.8	36.4	37.0	34.5		54.7	63.8	66.4	12.3	3.4	94.6	56.7
Dyna-Gro	D49VC70	41	109	30492	33.4	22.3	34.0	7.6	2.9	3.8	2.6	36.9	37.5	36.9		58.0	67.2	69.9	11.2	3.6	101.0	59.3
Hubner	H6257RCSS	36	105	30928	33.5	21.7	31.9	7.4	2.9	3.8	2.4	38.3	38.9	36.8		58.4	67.6	70.5	11.4	3.3	101.4	59.7
Channel	203-01STXRIB	36	103	30202	33.8	20.8	32.7	7.1	3.1	4.8	2.6	40.0	40.6	36.8		57.3	67.8	70.7	11.8	3.2	96.7	58.4
Pioneer	P0789AMXT	9	107	31073	33.8	21.2	34.6	7.5	3.4	3.8	2.5	38.4	39.0	32.1		53.0	63.1	65.9	13.2	3.0	89.5	55.2
Dekalb	DKC57-75RIB	36	107	32670	33.9	23.9	33.0	7.0	3.3	4.1	2.3	40.0	40.6	34.6		55.2	65.5	68.2	12.8	3.0	91.6	56.2
Pioneer	P0414AM	3	104	31654	34.0	24.6	36.9	7.3	2.9	3.7	2.4	36.3	36.9	36.4		57.1	67.4	70.3	10.8	3.6	103.6	60.3
Masters Choice	MCT5371	10	103	31363	34.3	22.6	31.6	7.0	3.2	3.7	2.1	39.5	40.1	34.1		55.8	65.3	68.1	12.6	3.0	92.0	56.1
Dekalb	DKC59-07RIB	36	109	30782	34.4	26.1	35.0	7.0	3.2	3.5	2.4	37.2	37.8	34.1		54.2	63.9	66.6	12.5	3.2	92.8	56.1
Channel	206-11STXRIB	36	106	32815	35.5	24.7	34.9	7.3	3.0	3.9	2.5	37.8	38.4	36.6		57.4	66.4	69.3	11.7	3.4	98.0	58.3
Seedway	SW5440GENSS	36	105	30782	35.5	22.5	32.5	7.1	3.4	4.0	2.5	40.0	40.6	33.2		53.0	63.8	66.6	13.4	2.8	87.3	54.5
Seedway	SW5554GT	10	105	28314	35.6	25.1	36.8	7.0	2.8	3.5	2.3	36.9	37.4	36.6		57.4	67.8	70.7	10.9	3.6	103.8	60.5
Albert Lea Viking	O.51-04GS	1	104	29766	35.7	21.1	34.7	6.6	3.1	3.6	2.6	38.6	39.1	35.2		55.1	65.7	68.4	12.3	3.2	94.9	57.0
Growmark FS	FS 53R85SS	34	103	31073	35.8	24.2	35.1	7.0	3.2	3.8	2.5	37.7	38.3	35.6		55.5	66.1	68.9	11.8	3.3	97.8	58.3
Channel	207-90STXRIB	36	107	30928	36.1	24.2	34.9	7.6	3.2	4.0	2.5	38.3	38.9	35.1		55.7	64.6	67.4	12.6	3.2	92.9	56.4
Syngenta NK	NK0968-3000GT	14	109	32380	36.7	24.0	32.3	7.1	3.2	3.8	2.1	40.4	41.0	36.8		57.1	67.3	70.1	12.1	3.1	95.0	57.4
Local Seed Company	LC0488 SXXRIB	36	104	31218	38.9	25.6	34.1	6.8	3.1	4.0	2.3	38.9	39.5	35.0		55.6	65.6	68.4	12.4	3.2	95.0	57.4
103-110 day RM Mean				31186	34.1	23.5	33.8	7.2	3.1	3.9	2.4	38.6	39.2	35.3		55.8	65.9	68.8	12.1	3.2	95.4	57.4
LSD (0.10)				NS²	2.9	NS	4.8	NS	0.3	0.5	0.3	3.8	3.9	2.6		3.0	3.0	3.1	1.8	0.6	12.0	4.4
Overall Mean				31347	34.8	23.3	34.2	7.2	3.1	3.9	2.4	38.4	39.0	35.3		55.9	66.0	68.9	12.0	3.2	96.1	57.7

Table 4b: Hybrid traits and performance for 96-110 day RM groups at Madrid, NY.

Company/Brand	Hybrid	Trait Code †	Relative Maturity	Harvest	Dry	Yield,	Starch	Crude	Lignin	Ash	Total	aNDFom	NDF	12 hr	Wet Chem	30 hr	120 hr	240 hr	240 hr	RFC - Fill	CNCPS v. 7.0	CNCPS v. 7.0	
				Population	Matter	35% DM	% DM	% DM	% DM	% DM	% DM				Fatty Acids						30 hr	uNDFom	Ratio ¹
				plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% NDF	% NDF	% NDFom	% NDFom	% NDFom	% DM	Ratio ¹		Allowable	Dry Matter
																						Milk Yield	Intake
																						lbs/day	lbs/day
Mycogen	F2F499	34	99	31833	31.6	24.9	36.6	7.4	1.9	3.0	2.5	35.2	35.8	44.5		69.1	77.4	80.8	6.8	5.4	133.6	71.5	
Growmark FS	FS 49R79SS	34	99	33833	32.0	28.8	31.5	8.3	2.8	3.6	2.3	38.3	38.9	36.7		60.2	67.6	70.7	11.3	3.5	102.6	60.3	
Viking	O.79-00	1	100	33000	32.1	27.3	37.5	7.2	2.7	3.2	2.8	35.7	36.2	38.6		59.3	67.8	70.8	10.5	3.9	109.0	61.9	
Mycogen	BMR97B37	35	97	34167	32.3	25.2	34.5	7.4	2.2	3.1	2.5	37.5	38.1	43.2		68.2	75.7	78.9	8.0	4.9	127.0	69.2	
Dairyland	HiDF-3197RA	35	97	35333	32.6	29.0	36.4	7.7	2.6	3.3	2.5	36.7	37.2	39.5		60.8	69.5	72.5	10.1	4.0	110.2	62.7	
Channel	197-90STXRIB	36	97	35167	32.7	29.1	33.4	8.0	2.7	3.2	2.3	37.2	37.8	36.7		60.8	67.8	70.7	10.9	3.8	107.7	61.9	
Wolf River Valley	3900FL	48	100	34667	32.7	31.5	26.9	7.8	3.2	3.5	2.2	41.6	42.2	35.1		57.8	64.9	67.7	13.5	2.8	88.0	54.5	
CROPLAN	4004	1	100	33333	32.8	26.9	34.7	7.3	2.7	3.3	2.7	37.7	38.3	38.6		60.5	68.3	71.3	10.9	3.8	107.6	61.8	
Doebler's	4018AMXT	9	100	35833	33.2	29.3	37.1	7.4	2.4	3.2	2.6	34.9	35.4	39.6		62.3	70.8	73.9	9.2	4.4	117.6	65.4	
Augusta Seed Corp.	A2448	20	98	35333	33.3	28.5	33.6	8.0	2.8	3.3	2.6	36.8	37.3	35.3		57.4	64.6	67.4	12.0	3.5	98.4	58.2	
Dekalb	DKC51-40RIB	42	101	33167	33.4	27.5	35.0	7.5	2.6	3.5	2.5	36.1	36.6	38.0		60.5	69.1	72.2	10.1	3.9	111.1	63.2	
Local Seed Company	ZS9725 VIP3111	17	97	32833	33.4	27.3	37.2	8.0	2.7	3.7	3.0	33.8	34.3	35.7		58.6	66.9	69.6	10.3	4.0	110.5	62.8	
Hubner	H6219RCSS	36	100	34333	33.5	26.8	34.4	7.8	2.6	3.3	2.2	36.9	37.4	38.3		61.6	69.0	71.9	10.4	4.0	110.8	63.1	
Dekalb	DKC50-09RIB	42	100	33333	33.7	27.8	38.1	7.7	2.5	3.3	2.8	33.9	34.4	38.7		61.7	69.7	72.7	9.3	4.4	118.3	65.7	
Dairyland	HiDF-3202P	31	102	32667	33.7	29.2	37.9	8.0	2.3	3.0	3.0	34.2	34.7	40.3		62.6	69.8	72.9	9.3	4.5	120.4	66.4	
Channel	202-81STXRIB	36	102	33667	33.9	30.2	34.8	7.6	2.6	3.2	2.6	36.4	36.9	38.3		62.3	70.2	73.2	9.8	4.1	115.1	64.7	
Hubner	H6225RCSS	36	102	33833	33.9	27.8	37.1	7.5	2.4	3.2	2.4	35.5	36.0	39.8		62.1	71.4	74.5	9.2	4.3	116.0	65.0	
Masters Choice	MCT4934	17	99	27167	34.0	23.5	31.9	8.1	2.5	3.3	2.1	36.9	37.8	36.9		62.9	71.1	74.2	9.6	3.8	113.0	63.9	
Augusta Seed Corp.	A3750	16	100	35000	34.4	28.5	34.3	7.4	2.8	3.4	2.5	37.8	38.3	36.0		58.4	66.3	69.1	11.7	3.5	100.4	59.0	
Hubner	H6124RCSS	36	96	34333	34.8	30.2	33.6	7.9	2.7	3.2	2.3	37.8	38.3	38.1		61.1	68.2	71.1	11.0	3.8	107.0	61.6	
Syngenta NK	NK9738-3220	20	97	33167	34.9	27.8	35.0	8.1	2.5	3.3	2.5	35.3	35.8	37.3		61.1	67.7	70.6	10.5	4.0	109.9	62.5	
Pioneer	P9998AMXT	9	99	33833	34.9	31.3	42.9	8.0	2.4	3.0	2.8	29.5	29.9	37.1		59.7	67.6	70.6	8.7	5.0	124.6	68.0	
Doebler's	3618AMXT	9	96	34000	34.9	28.8	37.4	8.2	2.4	3.2	2.4	33.9	34.4	37.9		60.9	68.6	71.6	9.7	4.3	115.9	65.0	
Doebler's	4115AMXT	9	101	33833	35.1	30.1	36.6	7.0	2.5	3.2	2.2	36.5	37.1	39.0		61.5	71.0	74.0	9.5	4.1	112.6	63.7	
CROPLAN	3899	42	98	33167	35.5	28.7	40.6	7.5	2.2	2.9	2.8	32.4	32.9	40.0		62.7	71.0	74.0	8.5	4.9	123.8	67.6	
Growmark FS	FS 46R77SS	34	96	33500	35.8	26.7	31.4	7.5	2.7	3.1	2.1	39.5	40.1	37.1		61.5	68.2	71.1	11.5	3.6	103.6	60.4	
Dekalb	DKC47-27RIB	42	97	34333	36.1	28.4	36.8	7.5	2.5	3.4	2.4	35.5	36.0	38.5		61.3	69.4	72.4	9.8	4.1	113.9	64.1	
Masters Choice	MCT4632	16	96	30000	36.5	27.5	38.6	8.7	2.3	3.4	2.4	32.0	32.5	39.4		63.0	72.0	75.2	8.2	5.1	125.1	68.7	
			96-102 day RM Mean	33524	33.9	28.2	35.6	7.7	2.5	3.2	2.5	35.9	36.5	38.4		61.4	69.3	72.3	10.0	4.1	112.6	63.7	
			LSD (0.10)	2099	2.2	2.8	4.9	0.5	0.3	0.3	0.3	4.0	4.0	2.1		2.3	2.7	2.9	1.7	0.8	12.3	4.5	
			Overall Mean	33576	32.9	28.5	35.4	7.7	2.5	3.2	2.5	35.9	36.4	38.6		61.8	69.9	72.9	9.8	4.2	114.0	64.2	

Table 4b: Hybrid traits and performance for 96-110 day RM groups at Madrid, NY (cont.).

Company/Brand	Hybrid	Trait Code †	Relative Maturity	Harvest	Dry	Yield,	Starch	Crude	Lignin	Ash	Total	aNDFom	NDF	12 hr NDFD	Wet Chem	30 hr NDFD	120 hr NDFD	240 hr NDFD	240 hr uNDFom	RFC - Fill	CNCPS v. 7.0	CNCPS v. 7.0	
				Population	Matter	35% DM		Protein			Fatty Acids				Ratio ¹					Predicted Allowable Milk Yield	Predicted Dry Matter Intake		
				plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM		lbs/day	lbs/day	
Channel	210-98STXRIB	36	110	33500	28.7	27.6	33.8	7.9	2.6	3.2	2.5	36.8	37.4	37.3		60.9	68.4	71.3	10.6	3.8	108.1	61.8	
Mycogen	BMR10B27	35	110	32667	28.9	24.8	31.8	7.5	1.8	2.8	2.2	38.1	38.7	45.2		71.5	78.9	82.3	6.8	5.2	133.2	71.8	
Doebler's	5018AM	3	110	35167	29.0	29.7	35.5	7.6	2.4	3.0	2.4	35.8	36.4	40.0		61.6	70.4	73.3	9.6	4.1	113.7	63.9	
Mycogen	BMR06B58	37	106	31667	30.1	25.7	30.9	7.9	1.9	3.1	2.3	40.7	41.3	47.7		72.6	83.1	86.7	5.5	5.2	133.2	71.9	
Hubner	H6257RCSS	36	105	32833	30.5	25.5	31.6	8.0	2.4	3.5	2.4	37.4	37.9	39.9		63.7	71.3	74.4	9.7	4.0	114.3	64.5	
Doebler's	4717AMX	8	107	35333	30.6	29.5	32.4	7.5	2.8	3.2	2.2	39.2	39.8	37.4		60.2	68.6	71.5	11.2	3.5	103.7	60.5	
Seedway	SW5554GT	10	105	31667	30.7	29.4	33.6	7.6	2.6	3.3	2.2	38.3	38.9	39.3		62.0	70.6	73.7	10.1	3.8	110.1	62.8	
Channel	209-15STXRIB	36	109	33667	30.7	29.3	35.1	7.8	2.7	3.2	2.5	36.8	37.3	38.1		60.4	68.3	71.2	10.6	3.9	108.7	62.0	
Growmark FS	FS 55R25SS	34	105	32833	31.0	30.0	34.5	7.6	2.5	3.3	2.4	36.5	37.0	37.3		60.6	68.7	71.8	10.4	3.9	108.5	62.2	
Syngenta NK	NK0968-3000GT	14	109	33167	31.1	26.6	32.9	7.8	2.7	3.1	2.3	38.7	39.2	38.6		60.3	67.8	70.8	11.4	3.7	102.6	59.8	
Dekalb	DKC57-75RIB	36	107	36333	31.4	28.4	31.2	7.4	2.6	3.1	2.4	38.6	39.2	38.9		63.7	71.3	74.4	9.9	3.8	112.6	63.8	
Doebler's	4318AMXT	9	103	34000	31.6	30.1	36.3	7.8	2.6	3.3	2.3	34.8	35.4	36.7		59.4	68.9	71.7	9.9	4.0	111.4	63.2	
Masters Choice	MCT5790	1	107	32167	31.7	30.0	33.2	8.2	2.5	3.3	2.3	36.2	36.8	37.1		62.0	69.7	72.8	9.9	3.9	114.6	64.7	
Channel	203-01STXRIB	36	103	33167	31.8	24.5	35.8	7.5	2.3	3.2	2.7	34.8	35.4	40.2		64.4	72.1	75.2	8.6	4.5	122.2	67.1	
Channel	207-90STXRIB	36	107	33833	31.8	29.5	31.5	7.9	2.6	3.5	2.2	38.8	39.4	38.7		62.5	70.1	73.2	10.5	3.8	108.3	62.2	
Pioneer	P0789AMXT	9	107	35000	31.8	30.6	32.4	7.6	2.8	3.4	2.3	37.9	38.5	36.3		60.4	68.6	71.6	10.8	3.6	106.1	61.5	
Channel	206-11STXRIB	36	106	33333	32.1	28.3	36.0	8.0	2.4	3.2	2.9	33.7	34.2	39.0		63.0	68.9	71.9	9.5	4.5	120.2	66.3	
Dyna-Gro	D49VC70	41	109	34500	32.3	30.1	40.8	7.8	2.3	3.1	2.8	30.6	31.1	38.9		61.2	69.0	72.2	8.6	4.9	125.2	68.3	
Dekalb	DKC59-07RIB	36	109	34167	32.3	29.7	33.8	7.6	2.4	3.1	2.4	35.5	36.0	37.2		62.3	69.5	72.5	9.8	4.1	116.2	65.1	
Pioneer	P0414AM	3	104	33833	32.9	30.0	37.8	7.6	2.4	3.3	2.5	34.2	34.9	38.5		61.7	71.8	74.8	8.7	4.3	118.0	65.6	
Masters Choice	MCT5371	10	103	32833	33.1	28.8	29.8	7.2	2.7	3.2	2.1	40.1	40.6	37.5		62.3	70.2	73.2	10.8	3.6	106.0	61.4	
Seedway	SW5440GENSS	36	105	33833	33.3	29.6	38.0	7.9	2.4	3.0	2.6	32.8	33.4	37.7		61.5	69.6	72.7	9.0	4.4	120.4	66.5	
Albert Lea Viking	O.51-04GS	1	104	34000	33.3	29.8	41.3	7.7	2.2	3.1	3.0	30.7	31.2	39.5		62.2	71.0	74.1	8.0	5.1	127.1	68.9	
Local Seed Company	LC0488 SSSXRIB	36	104	31667	33.8	28.3	37.1	7.6	2.5	3.0	2.6	33.8	34.3	36.7		60.3	67.5	70.3	10.1	4.3	115.0	64.4	
Seedway	SW6614RR	2	109	34333	33.9	29.6	37.7	7.3	2.7	3.1	2.4	34.9	35.5	36.0		58.2	67.1	69.9	10.6	3.9	107.7	61.7	
Dekalb	DKC54-40RIB	42	104	34167	34.2	28.6	36.4	7.5	2.5	3.2	2.5	35.1	35.7	38.4		62.2	70.2	73.2	9.5	4.3	116.5	65.0	
Albert Lea Viking	O.48-08GS	1	108	34000	34.6	30.1	39.2	7.6	2.4	3.1	2.5	32.5	33.0	38.2		60.5	69.4	72.2	9.1	4.5	119.1	66.0	
CROPLAN	4549	1	105	34000	34.9	30.1	41.6	7.3	2.2	3.1	2.7	31.7	32.2	39.8		61.7	70.7	73.7	8.4	4.9	123.6	67.6	
Growmark FS	FS 53R85SS	34	103	33500	35.0	29.4	36.8	7.5	2.5	2.9	2.6	34.9	35.4	38.9		61.3	69.1	72.1	9.8	4.3	115.7	64.8	
				103-110 day RM Mean	33626	32.0	28.7	35.1	7.7	2.5	3.2	2.5	35.9	36.4	38.8		62.2	70.4	73.4	9.6	4.2	115.2	64.7
				LSD (0.10)	2099	2.2	2.8	4.9	0.5	0.3	0.3	0.3	4.0	4.0	2.1		2.3	2.7	2.9	1.7	0.8	12.3	4.5
				Overall Mean	33576	32.9	28.5	35.4	7.7	2.5	3.2	2.5	35.9	36.4	38.6		61.8	69.9	72.9	9.8	4.2	114.0	64.2

Table 4c: Hybrid traits and performance for 96-110 day RM groups at Aurora, NY.

Company/Brand	Hybrid	Trait Code †	Relative Maturity	Harvest	Dry	Yield,	Starch	Crude	Lignin	Ash	Total	aNDFom	NDF	12 hr NDFD	Wet Chem 30 hr NDFD	30 hr NDFD	120 hr NDFD	240 hr NDFD	240 hr uNDFom	RFC - Fill Ratio ¹	CNCPS v. 7.0	CNCPS v. 7.0	
				Population	Matter	35% DM	% DM	% DM	% DM	% DM	% DM										% DM	Predicted	Predicted
				plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% DM										% DM	Allowable Milk Yield	Dry Matter Intake
				plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	lbs/day	lbs/day			
Hubner	H6225RCSS	36	102	34333	36.9	21.5	37.2	7.6	2.8	2.6	2.5	36.6	37.1	36.8		59.2	67.2	70.1	10.9	3.8	104.5	60.1	
Doebler's	4018AMXT	9	100	32500	37.3	21.9	39.3	7.2	2.4	2.6	2.5	34.6	35.1	39.3		62.0	68.4	71.5	9.9	4.5	116.0	64.6	
Mycogen	F2F499	34	99	33667	37.8	19.7	40.1	7.6	1.9	2.5	3.0	33.9	34.4	44.3		69.6	79.0	82.4	5.9	6.0	139.4	73.4	
Wolf River Valley	3900FL	48	100	32500	37.9	24.2	31.8	6.9	3.1	2.6	2.3	40.1	40.8	34.1		57.2	62.4	65.3	14.0	3.1	85.9	53.1	
Mycogen	BMR97B37	35	97	33833	38.1	19.6	36.4	7.3	2.1	2.3	2.7	37.1	37.7	43.6		69.4	83.2	86.7	4.9	5.3	133.0	70.9	
Channel	197-90STXRIB	36	97	32667	38.2	22.1	38.8	7.5	2.7	2.8	2.8	34.7	35.2	36.6		59.0	64.1	67.0	11.5	4.1	103.0	59.3	
Hubner	H6219RCSS	36	100	35167	38.2	21.6	38.0	7.2	2.8	2.4	2.7	35.8	36.3	36.6		58.9	66.1	68.9	11.2	3.9	102.6	59.1	
Channel	202-81STXRIB	36	102	34333	38.5	22.3	36.8	7.4	2.6	3.1	2.7	36.1	36.7	39.2		62.2	70.9	73.9	9.4	4.2	113.9	64.0	
Pioneer	P9998AMXT	9	99	33333	38.8	20.4	39.6	7.7	2.5	2.6	2.8	34.1	34.6	37.5		60.4	67.5	70.6	10.1	4.3	111.2	62.4	
Growmark FS	FS 49R79SS	34	99	32833	38.8	22.3	38.3	7.9	2.8	2.5	2.8	35.5	36.1	36.1		58.2	67.4	70.3	10.7	3.9	105.0	60.2	
Masters Choice	MCT4632	16	96	31000	38.8	18.4	38.2	7.8	2.4	2.9	2.4	35.2	35.7	37.9		61.0	67.0	69.8	10.7	4.2	109.9	62.3	
Augusta Seed Corp.	A3750	16	100	34333	39.2	19.5	38.2	7.1	2.7	2.6	2.7	35.5	36.1	35.2		58.0	65.5	68.4	11.3	3.9	104.0	59.8	
Dairyland	HiDF-3202P	31	102	32000	39.2	22.6	39.5	7.6	2.5	2.5	2.8	34.8	35.4	38.2		60.5	66.1	68.9	10.9	4.3	109.0	61.6	
Viking	O.79-00	1	100	31833	39.3	19.3	41.2	7.1	2.6	2.6	2.8	34.8	35.3	37.7		59.8	67.5	70.5	10.2	4.3	111.6	62.7	
Local Seed Company	ZS9725 VIP3111	17	97	33167	40.0	19.7	33.9	7.1	3.0	2.9	2.8	39.2	39.8	35.1		57.5	66.9	70.0	11.8	3.3	96.4	57.2	
Doebler's	4115AMXT	9	101	31667	40.1	21.2	35.8	6.5	2.6	2.7	2.2	38.7	39.2	37.4		60.3	67.1	69.8	11.7	3.8	101.3	59.2	
Dekalb	DKC51-40RIB	42	101	35333	40.2	23.7	39.8	7.3	2.5	2.6	2.7	34.5	35.0	38.5		60.7	69.4	72.3	9.5	4.4	115.9	64.5	
CROPLAN	3899	42	98	35500	40.4	22.7	37.7	6.8	2.6	2.4	2.5	37.2	37.7	39.7		61.5	67.9	70.7	10.9	4.1	108.0	61.3	
CROPLAN	4004	1	100	32833	40.4	21.9	41.4	6.8	2.8	2.5	2.6	35.7	36.3	36.6		57.1	63.4	67.0	11.8	4.0	101.1	58.7	
Dekalb	DKC50-09RIB	42	100	35000	40.8	19.8	39.2	7.3	2.6	2.6	2.9	34.7	35.2	37.8		61.0	71.0	74.0	8.9	4.4	117.3	65.0	
Augusta Seed Corp.	A2448	20	98	32000	41.2	21.3	40.4	7.6	2.7	2.6	2.8	33.2	33.7	34.7		57.3	62.1	65.0	11.7	4.1	101.8	58.7	
Masters Choice	MCT4934	17	99	32500	41.3	22.0	37.2	7.3	2.7	2.7	2.4	36.0	36.5	34.7		57.1	63.5	66.3	12.2	3.7	97.8	57.6	
Growmark FS	FS 46R77SS	34	96	33333	41.6	21.2	39.6	8.3	2.6	2.7	2.6	34.1	34.7	36.4		59.3	66.5	69.4	10.5	4.3	110.6	62.7	
Doebler's	3618AMXT	9	96	34167	42.1	20.0	40.5	7.0	2.6	2.5	2.7	34.8	35.3	36.9		58.5	64.2	67.1	11.5	4.1	103.5	59.4	
Dekalb	DKC47-27RIB	42	97	34667	42.2	21.8	44.1	7.3	2.5	2.4	2.7	31.3	31.8	36.8		59.2	65.0	68.0	10.1	4.7	116.7	64.7	
Hubner	H6124RCSS	36	96	33667	42.7	22.4	45.0	7.4	2.4	2.8	2.9	31.2	31.7	36.7		58.2	63.8	67.3	10.3	4.7	115.2	64.1	
Syngenta NK	NK9738-3220	20	97	35333	43.0	21.5	42.4	7.6	2.5	2.4	2.7	33.3	33.8	36.4		59.3	67.1	70.3	9.9	4.5	114.6	63.8	
Dairyland	HiDF-3197RA	35	97	34667	45.6	22.4	43.4	6.8	2.5	2.6	2.7	34.5	35.0	38.7		59.4	66.5	69.5	10.6	4.4	111.0	62.5	
			96-102 day RM Mean	33506	39.9	21.3	39.1	7.3	2.6	2.6	2.7	35.3	35.8	37.5		60.1	67.4	70.4	10.5	4.2	109.3	61.9	
			LSD (0.10)	2300	2.6	2.4	4.7	0.4	0.2	0.3	0.3	3.7	3.8	1.5		1.8	4.0	4.1	1.6	0.6	10.7	4.1	
			Overall Mean	33424	38.2	21.7	38.8	7.3	2.6	2.6	2.6	35.3	21.2	37.9		60.5	67.7	70.7	10.4	4.3	110.2	62.2	

Table 4c: Hybrid traits and performance for 96-110 day RM groups at Aurora, NY (cont.).

Company/Brand	Hybrid	Trait Code †	Relative Maturity	Harvest	Dry	Yield,	Starch	Crude	Lignin	Ash	Total	aNDFom	NDF	12 hr	Wet Chem	30 hr	120 hr	240 hr	240 hr	RFC - Fill Ratio ¹	CNCPS v. 7.0	CNCPS v. 7.0	
				Population	Matter	35% DM		Protein			Fatty Acids			12 hr NDFD	30 hr NDFD	120 hr NDFD	240 hr uNDFom	Predicted Allowable Milk Yield	Predicted Dry Matter Intake				
				plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% DM	% NDF	% NDF	% NDFom	% NDFom	% DM			lbs/day	lbs/day
Doebler's	5018AM	3	110	34333	32.0	23.1	33.6	7.1	2.6	2.6	2.2	38.7	7.1	38.5		61.5	67.8	70.6	11.4	3.8	104.4	60.4	
Masters Choice	MCT5790	1	107	32333	33.0	20.3	38.0	7.8	2.6	2.8	2.6	35.2	7.8	35.8		59.8	67.2	70.1	10.5	4.1	107.4	61.1	
Channel	210-98STXRIB	36	110	33000	33.6	22.9	37.4	7.3	2.7	2.6	2.6	36.4	7.3	37.0		60.1	65.3	68.3	11.6	4.0	103.3	59.6	
Growmark FS	FS 55R25SS	34	105	31667	34.4	21.7	35.4	7.3	2.7	2.8	2.4	37.6	7.3	36.2		60.0	65.7	68.6	11.9	3.8	100.4	58.6	
Mycogen	BMR10B27	35	110	33167	34.4	21.3	37.1	7.4	2.0	2.6	2.6	35.7	7.4	44.1		68.7	78.1	81.4	6.4	5.4	132.4	70.9	
Pioneer	P0414AM	3	104	32667	34.6	21.7	38.9	7.0	2.4	2.6	2.4	35.8	7.0	39.5		62.0	69.4	72.3	10.0	4.4	114.2	64.0	
Channel	209-15STXRIB	36	109	32833	34.7	20.4	40.4	7.6	2.4	2.5	2.9	33.3	7.6	39.3		61.2	71.5	74.5	8.4	4.6	121.0	66.4	
Mycogen	BMR06B58	37	106	32500	35.0	21.7	34.5	7.4	1.9	2.5	2.5	39.3	7.4	46.1		72.2	83.7	87.2	5.0	5.5	135.2	72.0	
Doebler's	4318AMXT	9	103	34167	35.2	22.2	36.5	7.2	2.8	2.9	2.2	35.9	7.2	35.9		58.1	64.6	67.4	11.7	3.7	100.8	58.9	
Dyna-Gro	D49VC70	41	109	32167	35.3	21.9	39.7	7.0	2.5	2.3	3.0	33.9	7.0	36.9		60.0	69.7	72.6	9.3	4.4	116.1	64.4	
Pioneer	P0789AMXT	9	107	34500	35.3	25.0	35.6	6.9	2.8	2.8	2.4	38.2	6.9	36.7		59.2	65.2	68.0	12.3	3.7	96.9	57.2	
Dekalb	DKC57-75RIB	36	107	35167	35.6	23.4	39.6	7.5	2.4	2.6	2.7	33.5	7.5	38.6		61.0	66.5	69.4	10.3	4.5	114.6	63.9	
Doebler's	4717AMX	8	107	33167	35.7	22.9	39.0	7.2	2.7	2.5	2.7	34.8	7.2	35.7		58.8	66.6	69.5	10.8	4.1	105.6	60.3	
Dekalb	DKC59-07RIB	36	109	32833	35.8	22.0	37.4	7.5	2.6	2.7	2.7	35.1	7.5	37.9		60.8	66.2	68.9	11.0	4.1	107.9	61.3	
Hubner	H6257RCSS	36	105	34333	35.8	20.7	40.3	7.3	2.4	2.2	2.8	33.4	7.3	39.2		60.5	67.8	70.8	9.9	4.5	113.7	63.2	
Seedway	SW5554GT	10	105	31500	35.8	19.7	35.4	6.9	2.7	2.5	2.2	38.8	6.9	37.6		60.3	66.3	69.2	12.0	3.7	100.0	58.5	
Seedway	SW6614RR	2	109	34667	36.8	22.3	38.6	6.6	2.8	2.7	2.5	35.9	6.6	35.7		57.8	63.8	66.6	12.0	3.8	99.3	58.0	
Seedway	SW5440GENSS	36	105	33167	37.0	20.5	38.1	7.6	2.6	2.8	2.8	34.8	7.6	36.4		59.1	64.8	67.7	11.3	4.0	104.7	60.0	
Albert Lea Viking	O.48-08GS	1	108	32500	37.3	21.1	37.6	6.5	2.6	2.6	2.3	36.6	6.5	38.1		59.9	67.0	69.8	11.1	3.9	105.8	60.6	
Channel	203-01STXRIB	36	103	34667	37.4	23.1	40.4	7.2	2.3	2.6	3.0	32.8	7.2	41.3		63.5	69.3	72.2	9.2	5.0	123.4	67.2	
Channel	206-11STXRIB	36	106	33333	37.5	22.7	37.5	7.4	2.5	2.7	2.6	35.9	7.4	39.9		62.2	70.2	73.2	9.7	4.3	114.5	64.0	
Local Seed Company	LC0488 S5XRIB	36	104	33000	37.6	21.8	40.5	7.2	2.6	2.5	2.7	33.8	7.2	35.5		58.8	65.7	68.5	10.8	4.2	106.8	60.7	
Masters Choice	MCT5371	10	103	30833	37.7	21.0	36.0	6.7	2.7	2.6	2.4	37.5	6.7	36.3		59.0	65.7	68.4	11.9	3.7	100.1	58.4	
Channel	207-90STXRIB	36	107	32833	37.8	23.1	37.7	8.0	2.5	2.6	2.7	35.5	8.0	38.9		62.6	70.4	73.4	9.5	4.4	115.7	64.4	
Syngenta NK	NK0968-3000GT	14	109	35000	39.2	23.5	40.1	7.1	2.6	2.5	2.4	35.2	7.1	37.0		58.0	64.4	67.1	11.6	4.0	101.8	58.9	
Albert Lea Viking	O.51-04GS	1	104	34667	39.5	21.6	43.5	7.2	2.3	2.4	3.0	31.4	7.2	39.6		61.0	67.9	70.9	9.2	5.0	124.2	67.5	
Growmark FS	FS 53R85SS	34	103	32000	40.0	21.1	42.0	7.1	2.5	2.4	2.7	32.4	7.1	38.7		59.9	65.8	68.7	10.2	4.6	115.2	64.0	
Dekalb	DKC54-40RIB	42	104	34000	41.1	23.7	43.9	7.0	2.5	2.6	2.9	31.3	7.0	37.1		58.8	66.3	69.0	9.8	4.7	119.1	65.7	
CROPLAN	4549	1	105	36000	45.6	22.4	42.9	6.7	2.4	2.4	2.5	33.9	6.7	40.0		60.8	68.7	71.8	9.7	4.7	116.0	64.4	
			103-110 day RM Mean	33345	36.6	22.0	38.5	7.2	2.5	2.6	2.6	35.3	7.2	38.3		60.9	68.0	70.9	10.3	4.3	111.0	62.6	
			LSD (0.10)	2300	2.6	2.4	4.7	0.4	0.2	0.3	0.3	3.7	3.8	1.5		1.8	4.0	4.1	1.6	0.6	10.7	4.1	
			Overall Mean	33424	38.2	21.7	38.8	7.3	2.6	2.6	2.6	35.3	21.2	37.9		60.5	67.7	70.7	10.4	4.3	110.2	62.2	

Figure 3. Interpretation of quartile plots used in Figures 4 and 5.

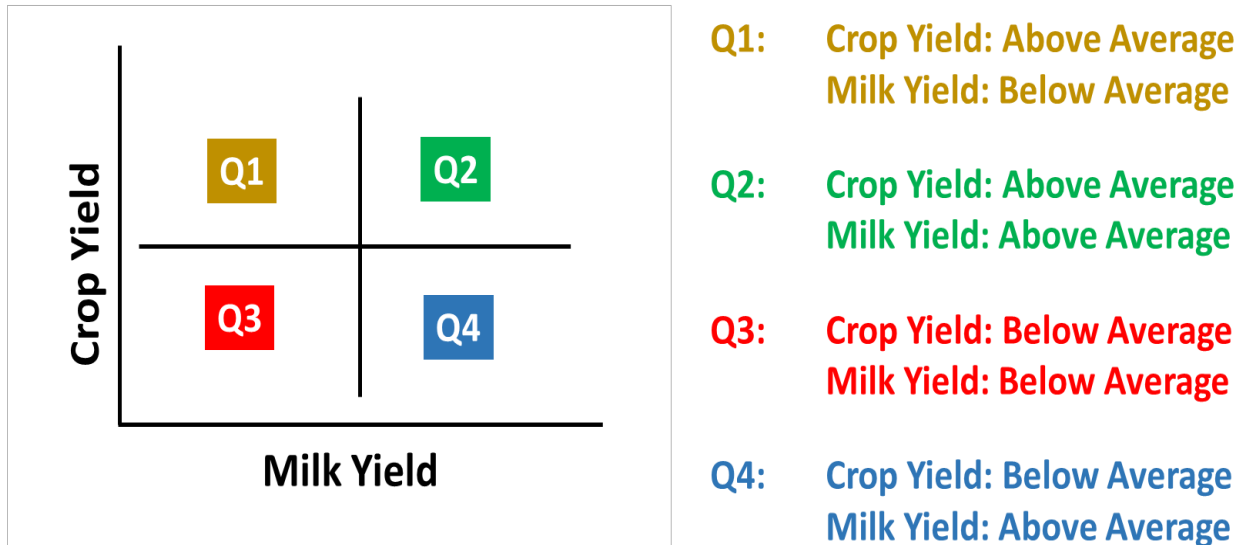


Figure 4.

Relationship between crop yield and predicted milk yield (PMY) for 80-95 day relative maturity (RM) hybrids planted at Albion, NY (4a), Willsboro, NY (4b) and Alburgh, VT (4c). Hybrids located in the top right quadrant were above the overall mean for both crop yield and PMY and are considered good performers. Hybrids located in the bottom left quadrant were below the mean for yield and milk production potential. Hybrids in the top left quadrant were below the mean for yield and above the mean for milk production potential and hybrids in the bottom right quadrant were above the mean for yield and below the mean for milk production potential.

Figure 5.

Relationship between crop yield and predicted milk yield (PMY) for 96-110 day relative maturity (RM) hybrids planted at Alburgh, VT (5a), Madrid, NY (5b), Aurora, NY (5c). Hybrids located in the top right quadrant were above the overall mean for both crop yield and PMY and are considered good performers. Hybrids located in the bottom left quadrant were below the mean for yield and milk production potential. Hybrids in the top left quadrant were below the mean for yield and above the mean for milk production potential and hybrids in the bottom right quadrant were above the mean for yield and below the mean for milk production potential.

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Figure 4a: Albion, NY 80-95 day RM hybrids.

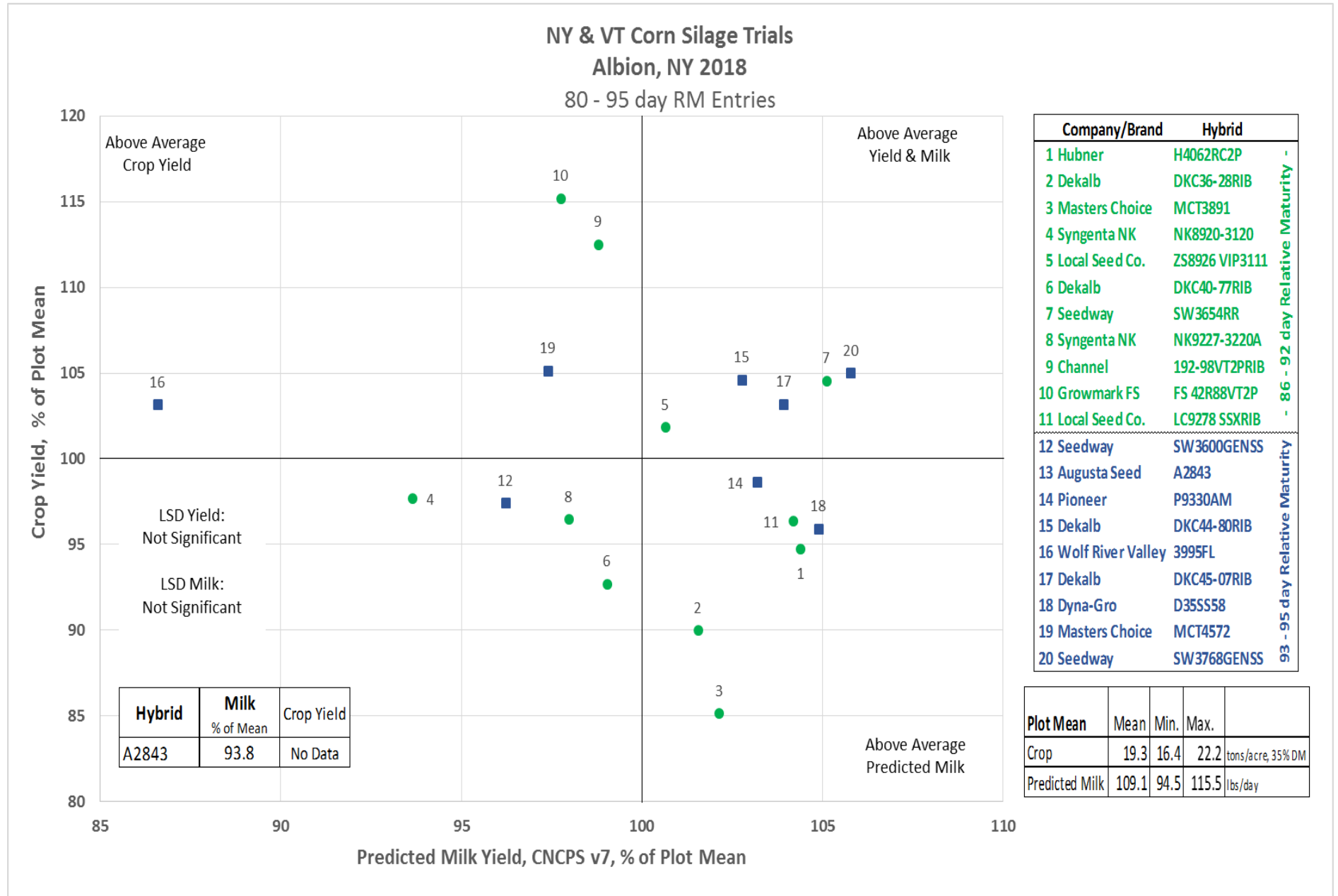


Figure 4b: Willsboro, NY 80-95 day RM hybrids.

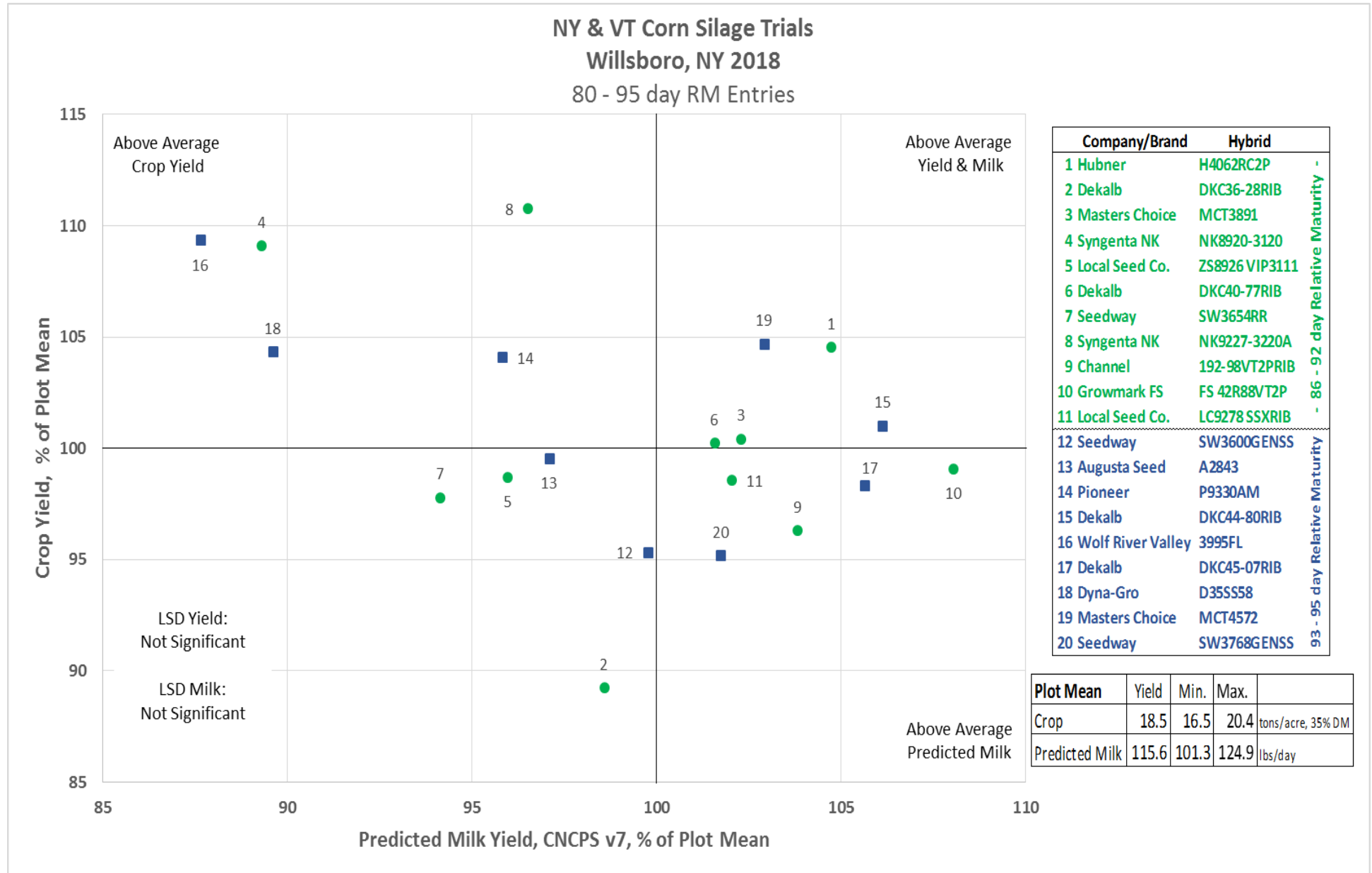
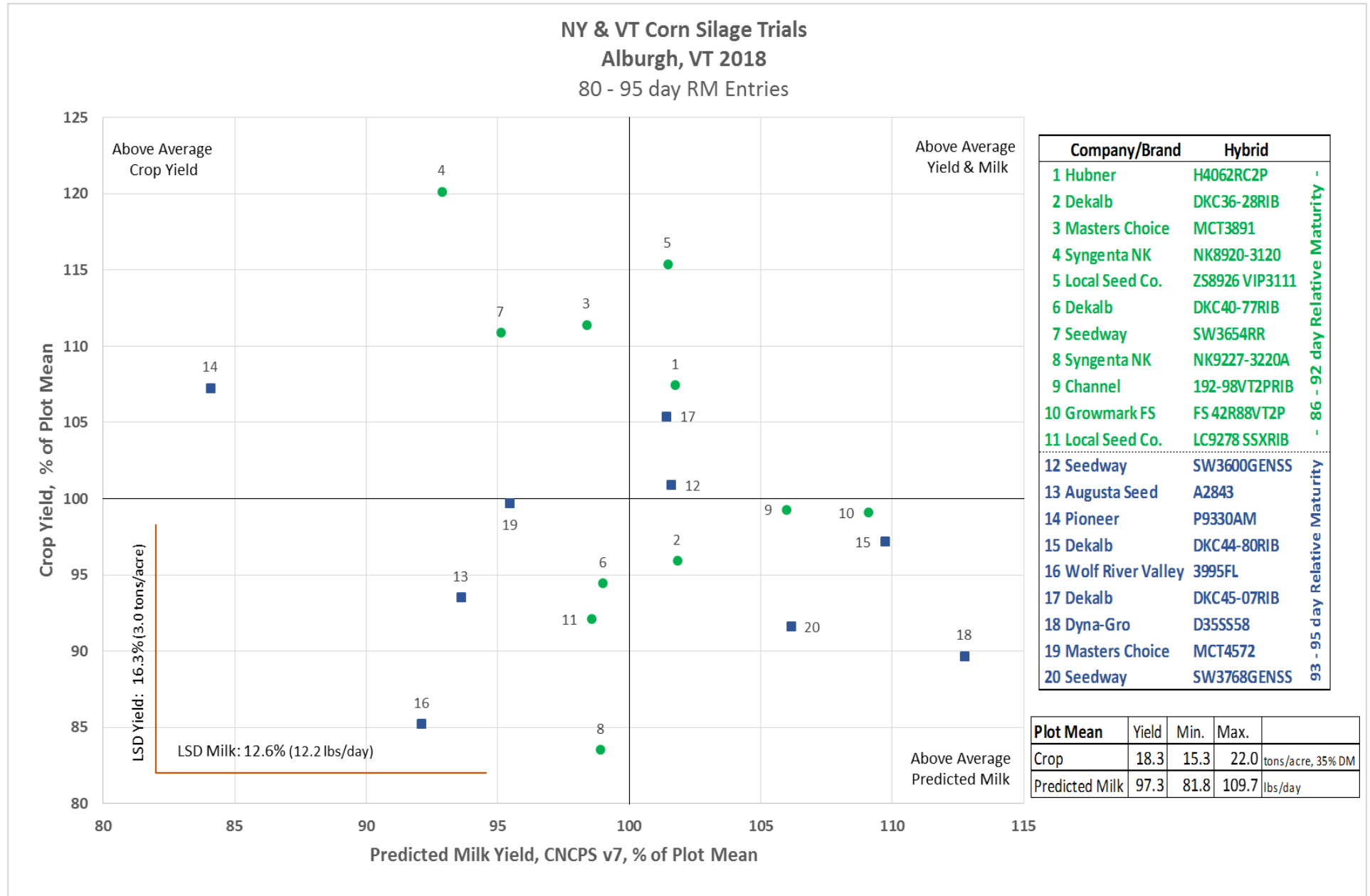


Figure 4c: Alburgh, VT 80-95 day RM hybrids.



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Figure 5a: Alburgh, VT 96-110 day RM hybrids, 96-102 day RM entries.

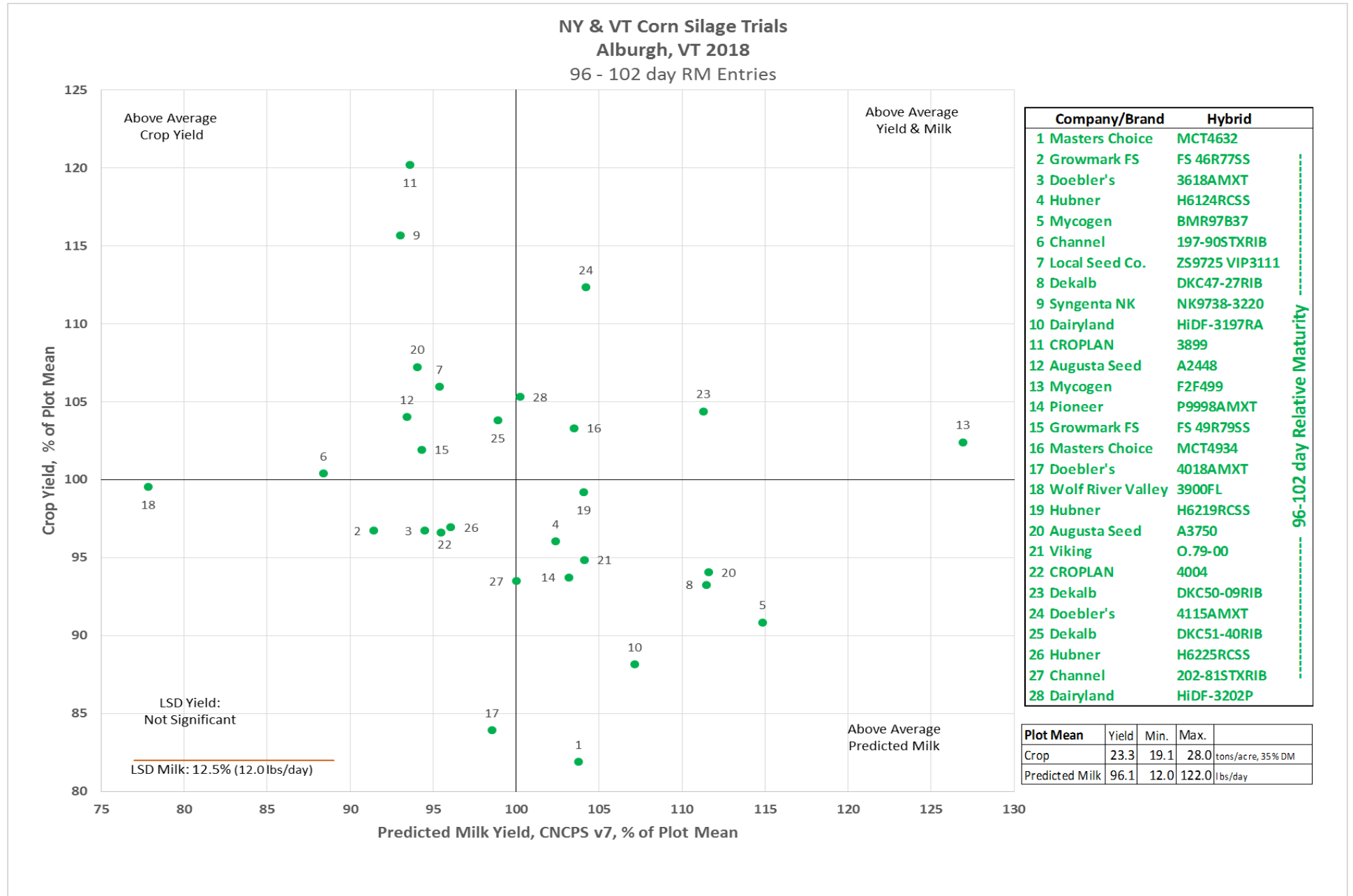


Figure 5a: Alburgh, VT 96-110 day RM hybrids, 103-110 day RM entries.

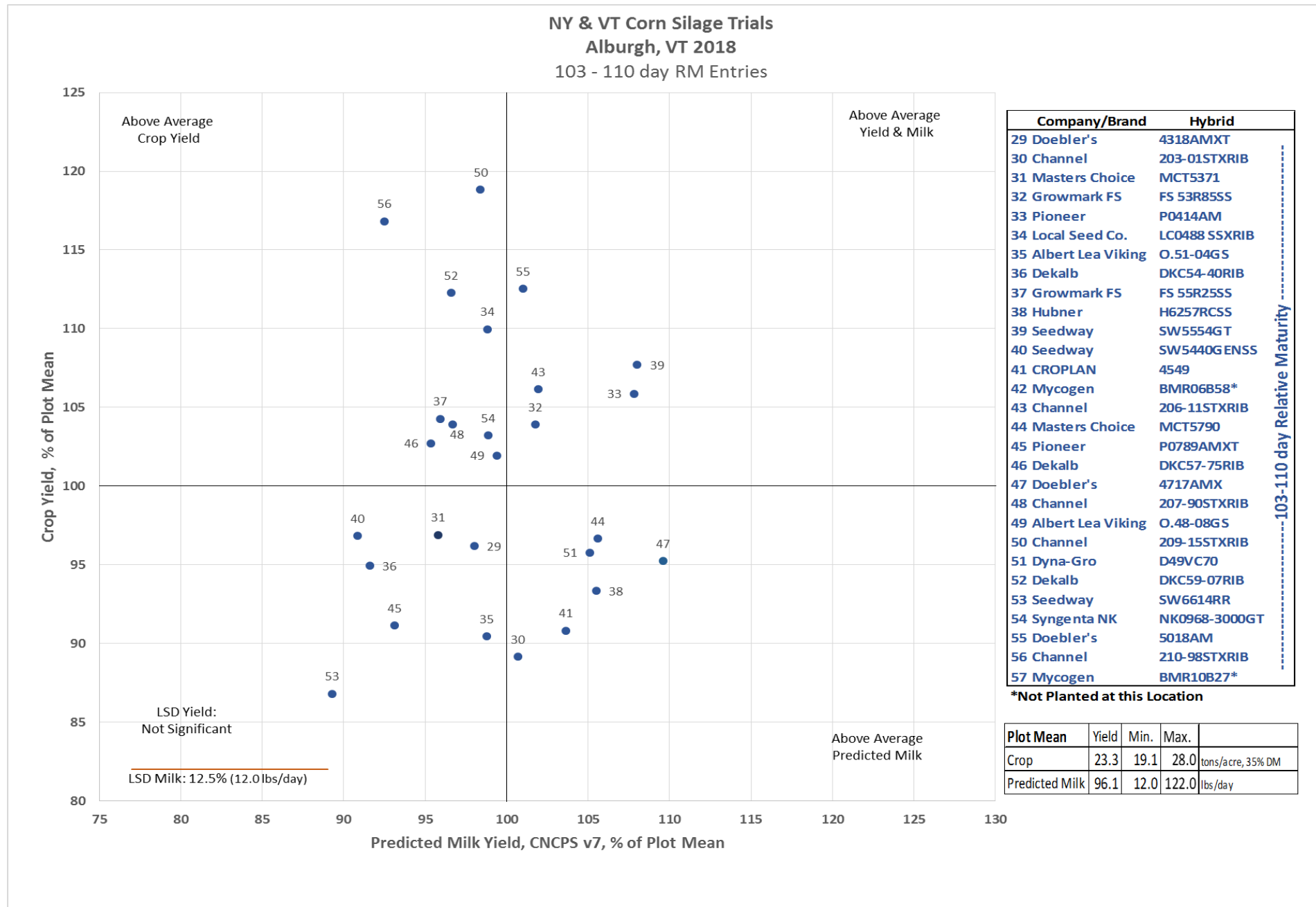


Figure 5b: Madrid, NY 96-110 day RM hybrids, 96-102 day RM entries.

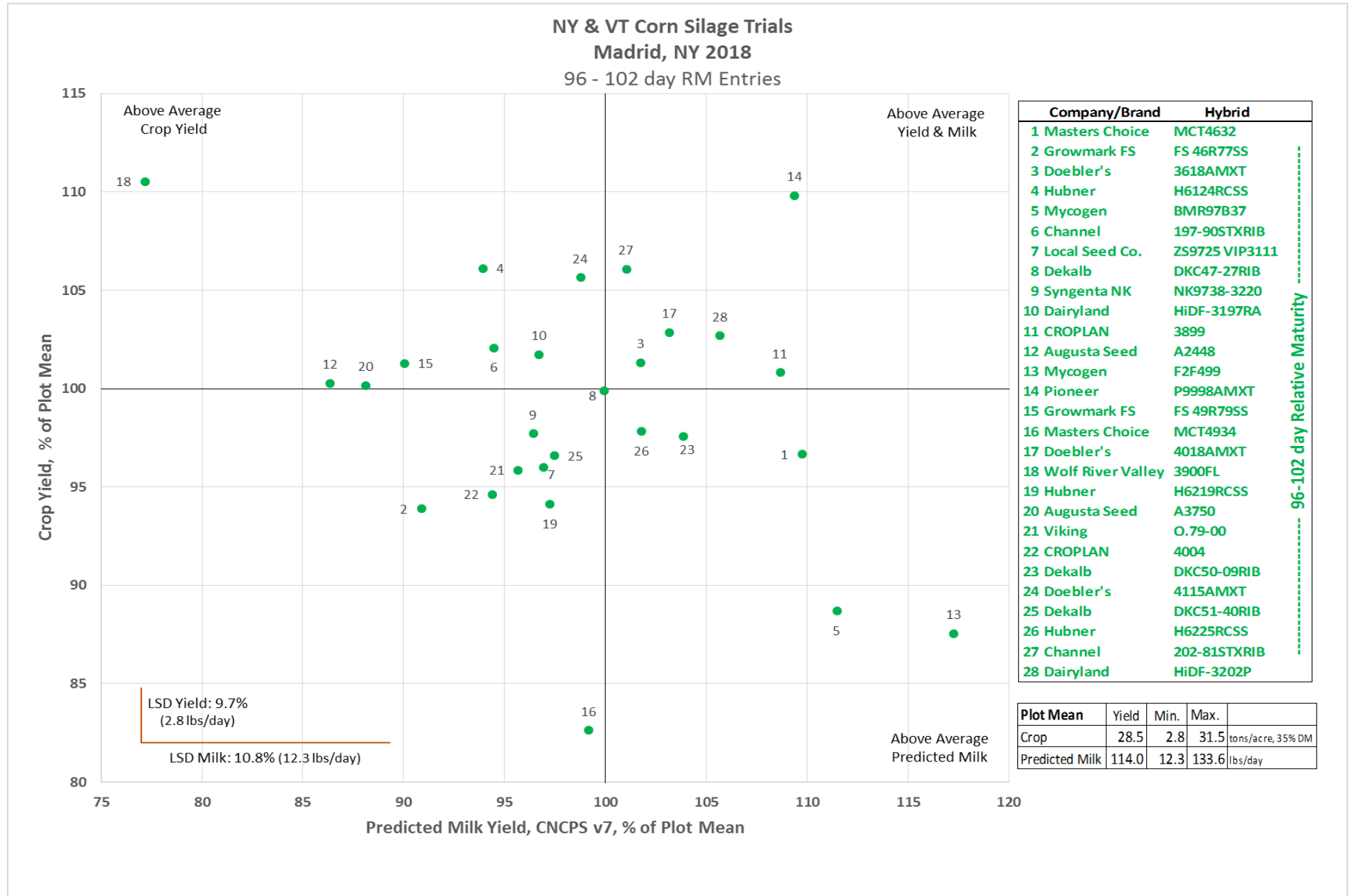


Figure 5b: Madrid, NY 96-110 day RM hybrids, 103-110 day RM entries.

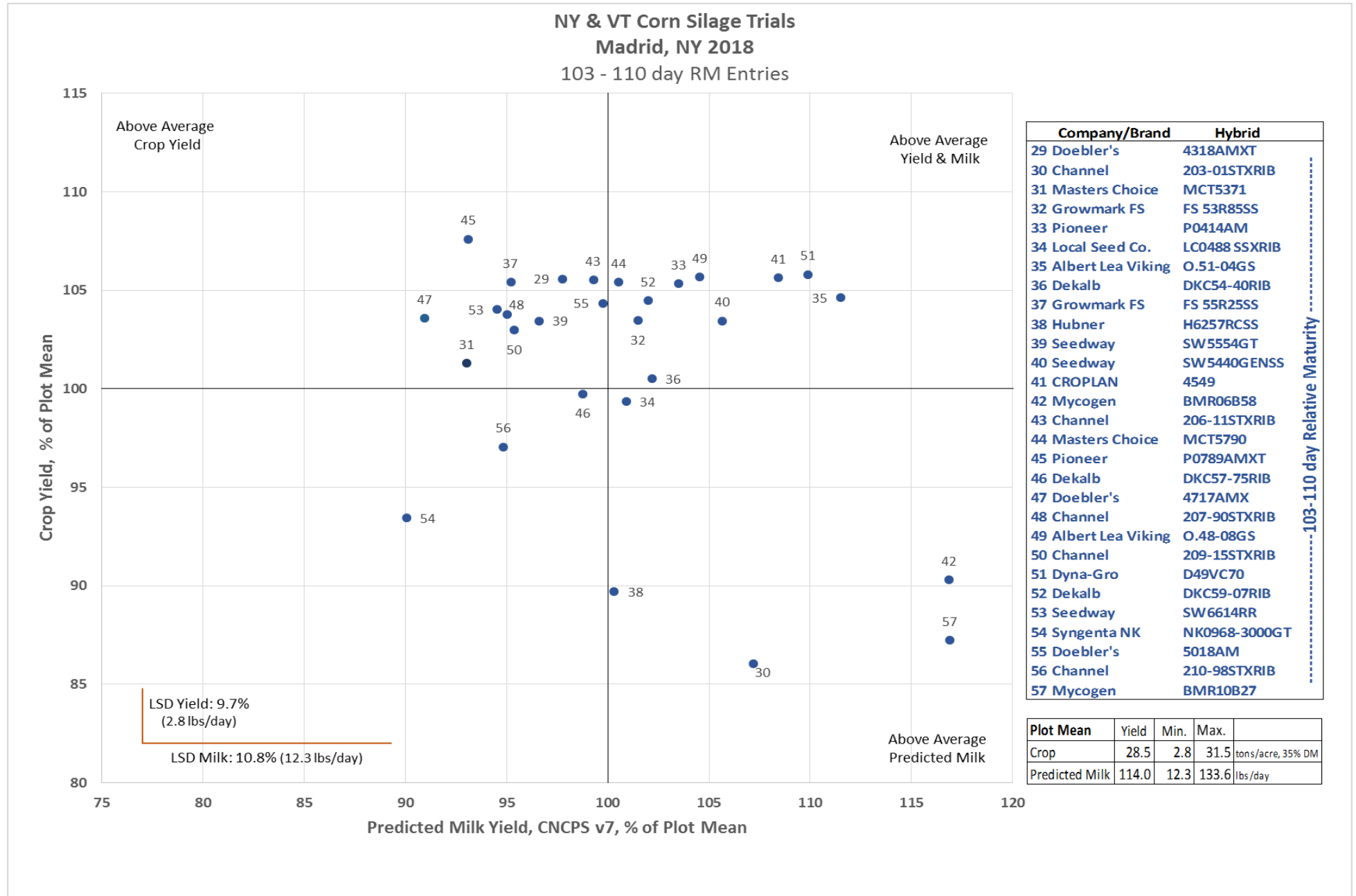


Figure 5c: Aurora, NY 96-110 day RM hybrids, 96-102 day RM entries.

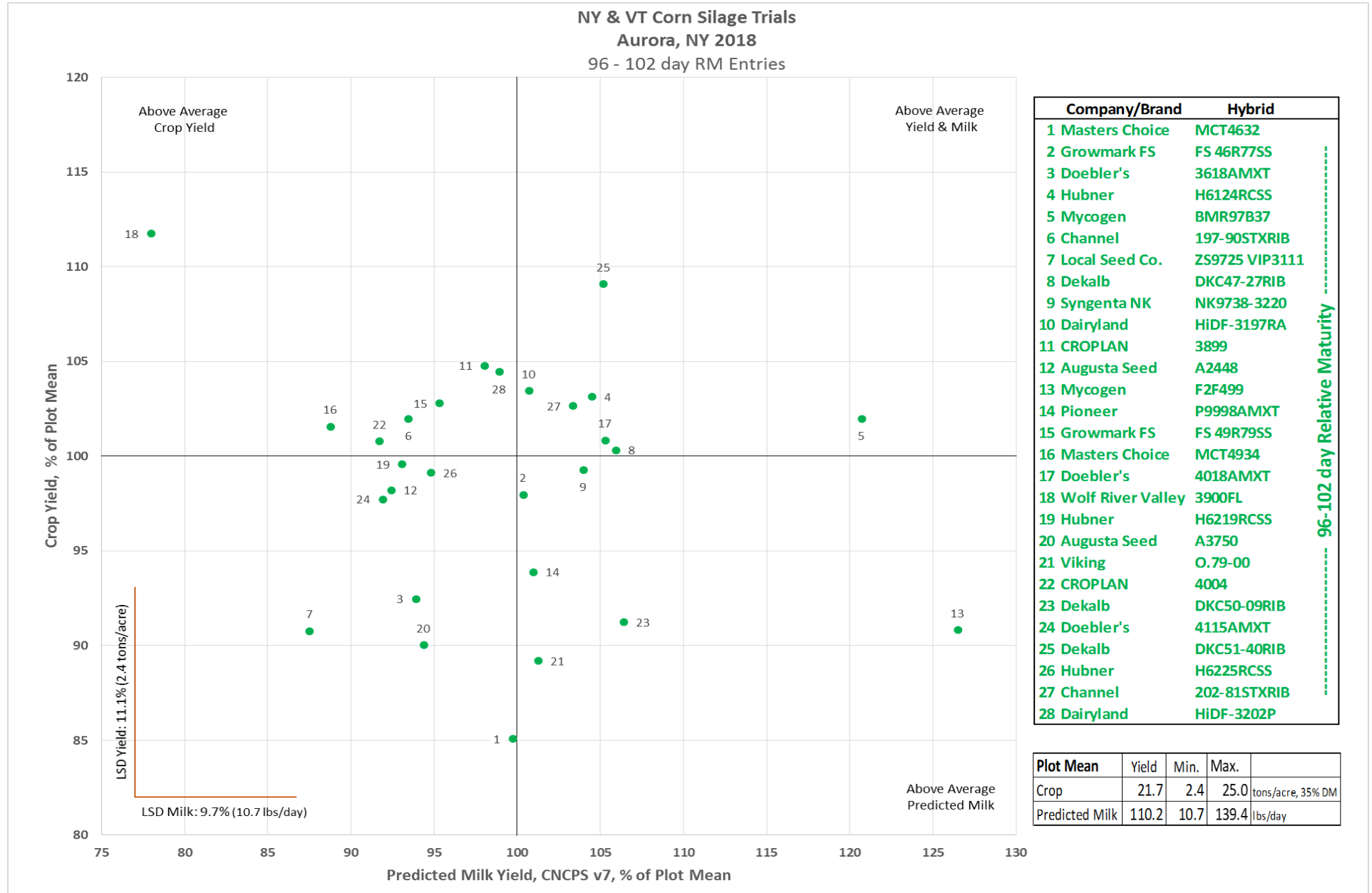


Figure 5c: Aurora, NY 96-110 day RM hybrids, 103-110 day RM entries.

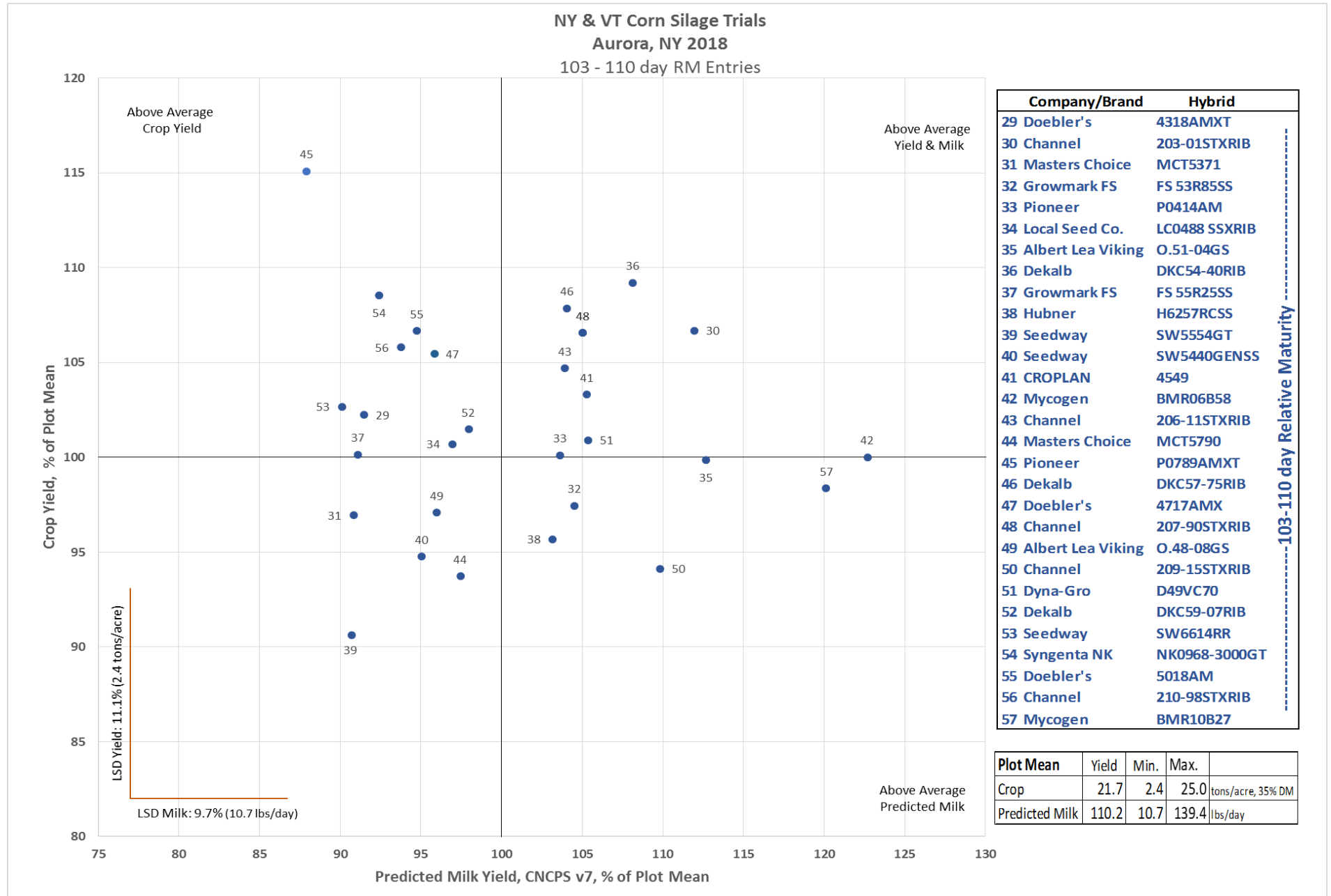


Table 5: Trait key for trait codes in Tables 3 and 4.

Trait Code	Trait
1	Conventional
2	Roundup Ready (RR), Roundup Ready 2 (RR2)
3	AcreMax (AM)
4	AcreMax CRW (AMRW)
5	AcreMax1 (AM1)
6	AcreMax Leptra (AML)
7	AcreMax TRIsect (AMT)
8	AcreMax Xtra (AMX)
9	AcreMax Xtreme (AMXT)
10	Agrisure GT
11	Agrisure GT/RW
12	Agrisure 3010
13	Agrisure 3010A
14	Agrisure 3000GT
15	Agrisure 3011A
16	Agrisure Viptera 3110 and 3110A
17	Agrisure Viptera 3111
18	Agrisure 3120 EZ Refuge
19	Agrisure 3122 EZ Refuge
20	Agrisure Viptera 3220 EZ Refuge
21	Agrisure Duracade 5122 EZ Refuge
22	Agrisure Duracade 5222 EZ Refuge
23	Herculex I (HXI)
24	Herculex RW (HXRW)
25	Herculex XTRA (HXX)
26	Intrasect (YHR)
27	Intrasect TRIsect (CYHR)
28	Intrasect Xtra (YXR)
29	Intrasect Xtreme (CYXR)
30	Leptra (VYHR)
31	Powercore
32	Powercore Refuge Advanced
33	QROME (Q)
34	SmartStax
35	Smartstax Refuge Advanced
36	SmartStax RIB Complete
37	SmartStax Enlist
38	Trecepta
39	Trecepta RIB Complete
40	TRIssect (CHR)
41	VT Double PRO
42	VT Double PRO RIB Complete
43	VT Triple PRO
44	VT Triple PRO RIB Complete
45	Yieldgard Corn Borer (YGCB)
46	Yieldgard Rootworm (YGRW)
47	Yieldgard VT Triple
48	Floury Leafy

Table 6: Trait descriptions

The Handy Bt Trait Table for U.S. Corn Production, updated January 2018

Trait packages in alphabetical order (acronym)	Bt protein(s) in the trait package	Marketed for control of:											Resistance to a Bt protein in the trait package has developed in: *	Herbicide trait		Non-Bt Refuge % (cornbelt)	
		B	C	E	F	S	S	S	T	W	C	R		GT RR2	LL		
		C	E	C	A	B	C	W	A	B	C	W					
AcreMax (AM)	Cry1Ab Cry1F	x		x	x	x	x	x						FAW WBC	x	x	5% in bag
AcreMax CRW (AMRW)	Cry34/35Ab1												x	CRW	x	x	10% in bag
AcreMax1 (AM1)	Cry1F Cry34/35Ab1	x		x	x	x	x	x					x	FAW SWCB WBC CRW	x	x	10% in bag 20% ECB
AcreMax Leptra (AML)	Cry1Ab Cry1F Vip3A	x	x	x	x	x	x	x	x	x					x	x	5% in bag
AcreMax TRIssect (AMT)	Cry1Ab Cry1F mCry3A	x		x	x	x	x	x					x	FAW WBC CRW	x	x	10% in bag
AcreMax Xtra (AMX)	Cry1Ab Cry1F Cry34/35Ab1	x		x	x	x	x	x					x	FAW WBC CRW	x	x	10% in bag
AcreMax Xtreme (AMXT)	Cry1Ab Cry1F mCry3A Cry34/35Ab1	x		x	x	x	x	x					x	FAW WBC CRW	x	x	5% in bag
Agrisure 3010 and 3010A	Cry1Ab			x				x	x						x	x	20%
Agrisure 3000GT and 3011A	Cry1Ab mCry3A			x				x	x				x	CRW	x	x	20%
Agrisure Viptera 3110	Cry1Ab Vip3A	x	x	x	x	x	x	x	x	x					x	x	20%
Agrisure Viptera 3111	Cry1Ab Vip3A mCry3A	x	x	x	x	x	x	x	x	x	x			CRW	x	x	20%
Agrisure 3120 EZ Refuge	Cry1Ab Cry1F	x		x	x	x	x	x						FAW WBC	Depends on hybrid; see bag for code EZ0 (GT) or EZ1 (GT LL)		5% in bag
Agrisure 3122 EZ Refuge	Cry1Ab Cry1F mCry3A Cry34/35Ab1	x		x	x	x	x	x					x	FAW WBC CRW			5% in bag
Agrisure Viptera 3220 EZ Refuge	Cry1Ab Cry1F Vip3A	x	x	x	x	x	x	x	x	x							5% in bag
Agrisure Duracade 5122 EZ Refuge	Cry1Ab Cry1F mCry3A eCry3.1Ab	x		x	x	x	x	x					x	FAW WBC CRW			5% in bag
Agrisure Duracade 5222 EZ Refuge	Cry1Ab Cry1F Vip3A mCry3A eCry3.1Ab	x	x	x	x	x	x	x	x	x			x	CRW			5% in bag
Herculex I (HXI)	Cry1F	x		x	x	x	x	x						FAW SWCB WBC	x	x	20%
Herculex RW (HXRW)	Cry34/35Ab1												x	CRW	x	x	20%
Herculex XTRA (HXX)	Cry1F Cry34/35Ab1	x		x	x	x	x	x					x	FAW SWCB WBC CRW	x	x	20%
Intrasect (YHR)	Cry1Ab Cry1F	x		x	x	x	x	x						FAW WBC	x	x	5%
Intrasect TRIssect (CYHR)	Cry1Ab Cry1F mCry3A	x		x	x	x	x	x					x	FAW WBC CRW	x	x	20%
Intrasect Xtra (YXR)	Cry1Ab Cry1F Cry34/35Ab1	x		x	x	x	x	x					x	FAW WBC CRW	x	x	20%
Intrasect Xtreme (CYXR)	Cry1Ab Cry1F mCry3A Cry34/35Ab1	x		x	x	x	x	x					x	FAW WBC CRW	x	x	5%
Leptra (VYHR)	Cry1Ab Cry1F Vip3A	x	x	x	x	x	x	x	x	x					x	x	5%
Powercore ^a Powercore Refuge Advanced ^b	Cry1A.105 Cry2Ab2 Cry1F	x	x	x	x	x	x	x						CEW WBC	x	x	^a 5% ^b 5% in bag
QROME (Q)	Cry1Ab Cry1F mCry3A Cry34/35Ab1	x		x	x	x	x	x					x	FAW WBC CRW	x	x	5% in bag
SmartStax ^a Smartstax Refuge Advanced ^b SmartStax RIB Complete ^b	Cry1A.105 Cry2Ab2 Cry1F Cry3Bb1 Cry34/35Ab1	x	x	x	x	x	x	x					x	CEW WBC CRW	x	x	^a 5% ^b 5% in bag
Trecepta ^a Trecepta RIB Complete ^b	Cry1A.105 Cry2Ab2 Vip3A	x	x	x	x	x	x	x	x	x					x		^a 5% ^b 5% in bag
TRIssect (CHR)	Cry1F mCry3A	x		x	x	x	x	x					x	FAW SWCB WBC CRW	x	x	20%
VT Double PRO ^a VT Double PRO RIB Complete ^b	Cry1A.105 Cry2Ab2		x	x	x	x	x	x						CEW	x		^a 5% ^b 5% in bag
VT Triple PRO ^c VT Triple PRO RIB Complete ^d	Cry1A.105 Cry2Ab2 Cry3Bb1		x	x	x	x	x	x					x	CEW CRW	x		^c 20% ^d 10% in bag
Yieldgard Corn Borer (YGCB)	Cry1Ab			x				x	x						x		20%
Yieldgard Rootworm (YGRW)	Cry3Bb1												x	CRW	x		20%
Yieldgard VT Triple	Cry1Ab Cry3Bb1			x				x	x				x	CRW	x		20%

*Check with local extension educators and seed dealers to determine the status of Bt resistance in your particular region.

Source: Michigan State University http://msue.anr.msu.edu/news/handy_bt_trait_table