NEW YORK and VERMONT CORN SILAGE HYBRID EVALUATION PROGRAM

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Hybrid evaluation at multiple environments helps in decision making and expands the reach of this type of data to more farmers. Cornell, UVM, and seed companies collaborate to provide this robust evaluation. Hybrids were either entered into the 80-95 day relative maturity (**RM**) group (Early-Mid) and were tested at two locations in NY (n = 27; Lamb Farms in Oakfield and the Willsboro Research Farm in Willsboro) and one location in VT (n = 27; 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 = 33; Greenwood Farms in Madrid and the Musgrave Research Farm in Aurora) and one location in VT (n = 33; Borderview Farm in Alburgh). Weather data, growing degree days (**GDD**; 86-50°F system) and precipitation, both for the current year and long-term averages, can be found in Tables 1a and 1b for trial locations.

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 Corn Growers Corn Research and Education Program, and the Cornell University Agricultural Experiment Station. Seed companies were invited to submit hybrids into either maturity group (three locations per maturity group) for a fee.

MATERIALS AND METHODS

In 2021, the corn silage hybrid evaluation program received 60 entries from 12 seed brands. 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. Hybrids were planted in a randomized complete block design with 3 replications.

The early-mid hybrids were planted in Oakfield, NY on May 13th, in Alburgh, VT on May 7th, and in Willsboro on May 19th. The mid-late hybrids were planted in Madrid, NY on May 12th, in Alburgh, VT on May 11th, and in Aurora, NY on May 20th. The early-mid hybrids were harvested on Sept. 3rd in Oakfield, Sept. 8th in Willsboro, and Sept. 10th in Alburgh. The mid-late hybrids were harvested on Sept. 14th in Madrid, September 16th in Alburgh and September 17th in Aurora. From planting to harvest, the early-mid hybrids had 2155 GDD in Willsboro, 2185 GDD in Oakfield, and 2193 GDD in Alburgh (86-50°F system). From planting to harvest, the mid-late hybrids had 2220 GDD in Aurora, 2175 GDD in Madrid, and 2242 GDD in Alburgh (Figure 1 and Table 2).

Information on soil type, planting and harvest dates, and fertility management can be found in Table 3 for each field location.

The goal was to harvest all hybrids at about 65% (±3%) moisture. The maturity groups were monitored, and harvest decisions were made by measuring whole plant dry matter (**DM**) tested 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 8 to 10 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 weighed on platform scales at the Willsboro location with plot weights determined from the RCI software computer interface on-board the tractor at a target cutting height of 8 to 10 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 8 to 10 inches.

An approximate 500 g sample was taken per plot replicate, resulting in 9 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. Samples were submitted to Cumberland Valley Analytical Services (Waynesboro, PA) where near-infrared spectroscopy (NIR) procedures were used to determine crude protein (**CP**), starch, lignin, linoleic acid (C 18:2), ash corrected neutral detergent fiber (**aNDFom**), and neutral detergent fiber digestibility (**NDFD**; 12, 30, 120, 240 h). One company paid an additional fee for wet chemistry analysis on NDFD at 30 h.

Corn silage hybrid performance was evaluated by the predicted milk production output of 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 diet and 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 near-infrared spectroscopy (NIR) 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. A base diet which fed a corn silage that represented the average feed chemistry of all hybrids was formulated by Dr. Tom Overton, Dr. Mike Van Amburgh, and Dr. Andrew LaPierre. Initially, each individual hybrid replicate replaced the base corn silage in the diet at the same DM amount. Subsequently, DMI of the entire diet was adjusted based on the first limiting rumen fill factor (either the rumen aNDFom pool size or 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 diet 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.

The GLM procedure was used for analyzing data using SAS software (v. 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 across much of the Northeast saw above average GDD accumulation in every month of the growing season except for July, which was slightly below long term means. Relatively dry conditions coupled with warmer temperatures as the month of May progressed provided generally good conditions for corn planting with all trial locations planted between May 7th and May 20th. Early in the season all locations, except for Aurora, experienced below average precipitation and dry conditions were of concern by the end of June at many locations across the region, including plot locations reported here. According to the June 29, 2021 U.S. Drought Monitor map, all locations, except for Aurora, were designated as Abnormally Dry (Oakfield and Willsboro) or Moderate Drought (Madrid and Alburgh). This changed in July when weather patterns shifted with all locations, except for Alburgh, receiving excessive rainfall (Tables 1a and 1b). By the beginning of August (August 3, 2021 U.S. Drought Monitor) drought conditions had receded for Madrid, Oakfield and Willsboro, with Alburgh remaining in Moderate Drought.

For the period of May thru August, Alburgh and Willsboro reported total precipitation below the long term mean for the location while all other locations reported precipitation well above average. September rainfall was slightly above average at all locations; however, is considered to have little influence on the crop this season. The crop proved generally resilient to these weather extremes (Table 2 and Figure 1) and adequate to abundant rainfall around tasseling and through the ear development phase shows general trends of a slightly negative impact on fiber digestibility but positive impact on starch content (Figure 3).

It is worth noting the variation in average whole plant DM for each location relative to GDD accumulation from planting to harvest (Figure 2). Figure 2 contrasts GDD accumulation from planting to harvest with the overall average whole plant DM for all hybrids grown at a given location. Additionally, the high and low marks on each graph reflect the approximate range in expected GDD's needed by hybrids within each relative maturity range to reach target harvest maturity for corn silage. While growing degree days remain an important indicator of plant progress throughout the season, these results align with previous growing seasons and show the impact of other influences on the plant growth and health (ranging from available moisture to overall soil health) on the actual maturation process of a plant.

Nitrogen Balances

A Nitrogen (N) balance can be calculated by subtracting the total N in the harvested crop from the total N supplied to the crop. The total N supplied includes current year fertilizer and manure N additions as well as N credits from previous manure applications, previous crops (sod or soybeans) and soil N supply (based on soil type). Contributions by previous crops and soil are both derived from book values. The total N taken up by the crop is calculated using the crop yield multiplied by the N concentration within the crop which is derived from the CP content (CP / 6.25). Manure N from past applications assumed 12% and 5% of the organic N from applications from one and two growing seasons before. The total N balance includes all N in manure applied to the current crop year. The available N balance assumes 35% from organic N and 0-65% (based on soil incorporation) from inorganic N in the manure to be available to the crop in the current year. Thus, total N balances will be higher than available N balances when manure is applied in the current crop year.

Based on this calculation a positive N balance indicates more N was applied than was taken up by the crop, suggesting that excess N was left in the soil at the end of the growing season or losses throughout the season were larger. This can represent the addition of N inputs beyond what the crop was able to utilize, which is most often the case when other conditions are not limiting plant growth. In the instance of first year corn after sod, a positive balance may remain even when additional N inputs are minimal. Or a scenario where the plant is not able to utilize available N and crop yield is limited by other factors, often extreme drought or prolonged periods of saturated soils.

A negative balance can also represent different scenarios. First, it can represent an inadequate supply of N and this would be reflected by depressed yields, visual signs of N deficiency (firing of leaves up to the ear leaf) or low test values from the end-of-season Corn Stalk Nitrate Test (CSNT). When yields are not compromised and no other indications of N deficiency are noted, a negative balance suggests that 1) the soil N supply may exceed the book value, 2) the crop is more efficient at utilizing available N than current N rate calculations give it credit for, or 3) both.

The results presented in Table 3, reflect the available N balance for each location in 2021. Available N Balance = Available N supply (soil N + sod/soybean N + fertilizer N + available manure N) - Total N uptake (yield x N concentration).

Least Significant Difference

Least Significant Difference (LSD) values are presented in Tables 4 and 5 as well as Figures 6 and 7. The LSD indicates the level of difference between two values that is statistically significant. When the reported values for two hybrids are within the LSD, this indicates that these differences cannot be attributed to hybrid alone and other factors may have contributed to the differences, such as environmental factors. When evaluating differences in hybrids, it is important to confirm if numerical differences are significant or not based on the LSD value.

Growing Conditions and Location Notes

Oakfield

For the period of May thru August, this location reported above average precipitation; however, it experienced below average precipitation in all months except for July, which was significantly above average and significantly influenced seasonal totals. Similarly, overall GDD accumulation was above average; however, in this case all months were above average except for July (Table 1a and Figure 1e).

This location resulted in the highest average yield of locations hosting the early maturity group (80-95 day RM) and received high levels of N inputs. A positive available N balance suggest that inputs exceeded crop need, even at this high level of yield.

Willsboro

This was one of two trial locations to end the season below the long term mean in overall precipitation; however, consistent with most other locations July rainfall was significantly above average. Growing degree day trends matched other locations across the region with above average GDD accumulation in all months except for July (Table 1a).

Uneven emergence within some plots was noted at this location, though it was not specific to all replicates on the same hybrid suggesting it was not a hybrid specific issue. Rather it appears to be the result of variable seed placement (seed depth). Uneven emergence can lead to slight variation in growth throughout the season and should be noted in reviewing data from this location.

The highest positive N balance (Table 3) was calculated at this location. The previous crop was an idle sod leading to the application of additional N out of concern that sod N credits would be less than an intensively managed sod. The positive balance suggest that N needs were largely met by the previous sod crop and additional N inputs were in excess of crop needs given the growing conditions experienced.

Alburgh

This was the driest location in this year's program, with the U.S. Drought Monitor reporting Abnormally dry conditions at planting and shifting to moderate drought early in the growing season and remaining in this status through harvest. Growing degree day accumulation followed the same trends as all program plot locations in 2021.

Available N balances were slightly negative for both plots at this location; however, moisture stress also had an impact on overall crop performance. With both relative maturity groups (80-95 day and 96-110 day RM) planted on separate fields within this one farm location, additional observations are possible relative to growing environment and differences in soil quality. Observations from the location report greater visual stress in the 96-110 day RM group which was located on a relatively dry, stony soil.

With both relative maturity groups planted at this location, harvest timing was split, with the first harvest taking place on September 10th and the second harvest taking place on September 16th (Table 3).

Aurora

This location received the greatest amount of rainfall with near average rainfall in May and June followed by excess rainfall in July and August at 52% and 102% above average, respectively. Growing degree-day accumulation followed the same trends of all locations with all months above average except for July (Table 1b).

A slightly positive N balance show N rates exceeded crop uptake and when coupled with strong yields show a relatively high N use efficiency which is consistent with recent research correlating higher N use efficiency with higher yields.

Madrid

This location ended the season with above average rainfall but did spend approximately one month, from June 15 to July 13, in a state of moderate drought (based on U.S. Drought Monitor). The move out of moderate drought came just in time for pollination, with tassel emergence starting approximately July 22, 2021. Growing degree day accumulation followed the same trends of all locations with all months above average except for July (Table 1b).

The available N balance (Table 3) is of note at this location and represents a scenario that has become more common, particularly in dairy systems, where there were no signs of N deficiencies and yields were quite high despite a negative available N balance. This reflects the ability of healthy soils, particularly those with a manure history, to supply N beyond current estimates and the ability of high yielding corn crops to utilize available N more efficiently (pounds of N per unit of yield).

Forage Quality and Yield

Individual hybrid results are presented in Tables 4 and 5 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. Results are sorted by DM and hybrids should only be compared with hybrids that

have a DM within ±3 DM points within a relative maturity group. Due to few hybrids being analyzed for wet chemistry parameters, an LSD was not calculated.

Figures 6 and 7 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 crop yield and below average in PMY, 2) above average in both 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 5). 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 for this growing season. This is a less desirable method of evaluation since conditions at a given location can vary greatly from season to season.

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 6 and 7) is a strong indicator of performance.

It may not always be desirable to select a hybrid that falls into the second quadrant in Figures 6 and 7 (above average in crop 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 in different growing environments 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, average to above average GDD accumulation coupled with significant mid-season rainfall resulted in robust yields and high starch content but lower fiber digestibility, particularly in comparison to 2020 (Figure 4). This suggests that changes will need to be made in feeding programs as farms transition from the 2020 to 2021 crop.

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 2021 for their collaboration. We urge all seed companies to participate in our corn silage testing program in 2022 so we can provide the best information under New York and Vermont growing conditions to our producers.

We thank Greenwood Dairy and Lamb Farms for their ongoing collaboration and support of the program; Paul Stachowski and Jeff Stayton at the Cornell Musgrave Research Farm, Aurora; Mike Davis, Adam Sayward and Delvin Meseck at the Willsboro Research Farm, Miner Institute and Roger Rainville at Borderview Farm for their efforts during field operations.

Additional financial support was provided by the Cornell University Agricultural Experiment Station.

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Table 1: Current season and historic 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		Oakfield, NY		Willsboro, NY		Alburgh, VT		Oakfield, NY		Willsboro, NY	
	2021	Avg.*	**2021**	Avg.*	**2021**	Avg.*	**2021**	Avg.*	**2021**	Avg.*	**2021**	Avg.*
May	**1.76**	3.79	**2.06**	2.70	**1.47**	3.40	**314**	309	**301**	317	**318**	309
June	**3.13**	4.54	**2.33**	3.67	**2.19**	4.33	**546**	472	**586**	503	**575**	486
July	**3.57**	4.32	**9.31**	4.30	**7.51**	3.82	**553**	623	**597**	647	**577**	648
August	**2.98**	4.42	**3.05**	3.56	**3.58**	3.62	**654**	573	**707**	605	**689**	603
September	**4.23**	3.98	**4.81**	3.32	**3.89**	3.04	**395**	382	**433**	416	**426**	407
May-August	**11.44**	17.06	**16.75**	14.23	**14.75**	15.16	**2067**	1977	**2190**	2072	**2159**	2046
May-September	**15.67**	21.03	**21.56**	17.55	**18.64**	18.21	**2462**	2359	**2623**	2488	**2585**	2453

*Avg. - Represents averages of years: 2005-2021

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	
	2021	Avg.*	**2021**	Avg.*	**2021**	Avg.*	**2021**	Avg.*	**2021**	Avg.*	**2021**	Avg.*
May	**1.76**	3.79	**3.46**	3.20	**1.15**	3.15	**314**	309	**291**	326	**292**	297
June	**3.13**	4.54	**3.81**	3.85	**3.36**	4.18	**546**	472	**564**	497	**550**	474
July	**3.57**	4.32	**6.08**	3.99	**6.26**	4.47	**553**	623	**573**	647	**539**	613
August	**2.98**	4.42	**7.85**	3.88	**3.50**	4.05	**654**	573	**682**	604	**655**	570
September	**4.23**	3.98	**3.83**	3.43	**3.76**	3.67	**395**	382	**404**	412	**373**	378
May-August	**11.44**	17.06	**21.20**	14.91	**14.27**	15.85	**2067**	1977	**2109**	2073	**2035**	1955
May-September	**15.67**	21.03	**25.03**	18.34	**18.03**	19.52	**2462**	2359	**2513**	2485	**2408**	2332

*Avg. - Represents averages of years: 2005-2021

Table 2: Precipitation and growing degree day (GDD) accumulation from planting date to harvest date.

Location	Seasonal Precipitation	Seasonal GDD (86/50)	Planting Date	Harvest Date
Madrid, NY	14.9	2175	12-May	14-Sep
Aurora, NY	21.3	2220	20-May	17-Sep
Alburgh, VT	12.8	2242	11-May	16-Sep
Willsboro, NY	14.0	2155	19-May	8-Sep
Oakfield, NY	15.4	2185	13-May	3-Sep
Alburgh, VT	12.5	2193	7-May	10-Sep

Table 3: NY & VT Corn Silage Hybrid Evaluation Program, 2021 Field Data.

	80 - 95 Day Relative Maturity			96 - 110 Day Relative Maturity		
	Alburgh, VT	Oakfield, NY	Willsboro, NY	Alburgh, VT	Aurora, NY	Madrid, NY
Planting Date	7-May	13-May	19-May	11-May	20-May	12-May
Harvest Date	10-Sep	3-Sep	8-Sep	16-Sep	17-Sep	14-Sep
Previous Crop	Corn	Corn	Sod	Corn	Soybeans	Corn
Starter N	5	32	15	5	25	32
Manure N	0	113	0	0	0	115
Sidedress N	96	95	90	96	101	0
Total Fertilizer N	101	240	105	101	126	147
Available N Balance[1]	-20	56	62	-24	23	-41
Soil Type	Amenia	Ontario	Kingsbury	Covington	Honeoye	Grenville

[1]Available N Balance = N Uptake by Crop - Available N Supply

A positive balance indicates there was excess N not utilized by the crop.

When N does not limit yield, a negative balance indicates more efficient N use or soil N supply compared to book values.

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), Oakfield, NY (1e).

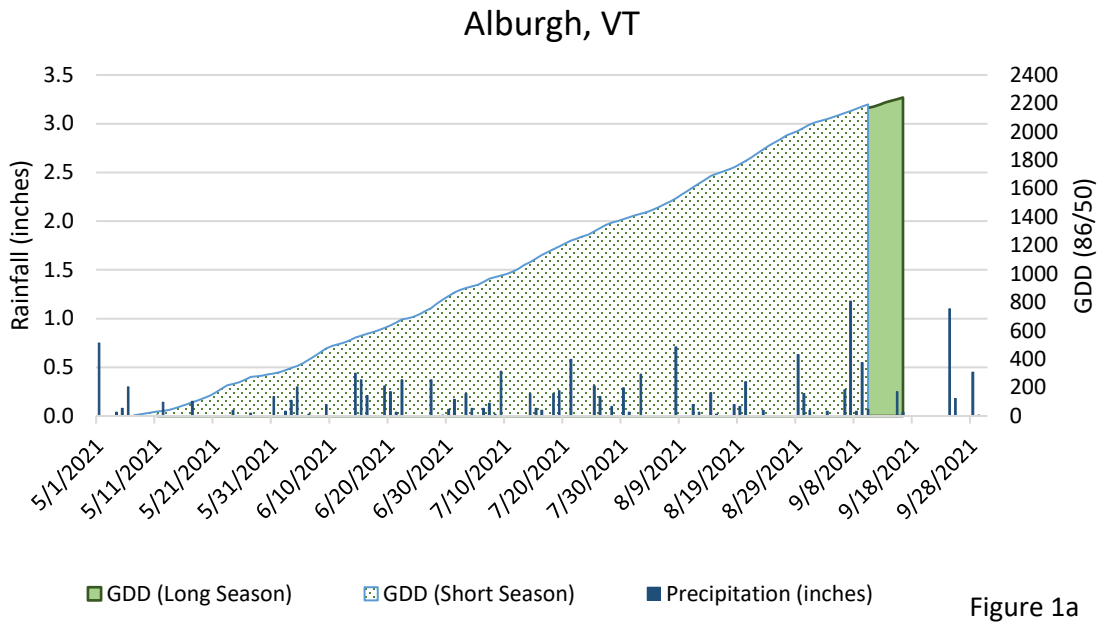


Figure 1a

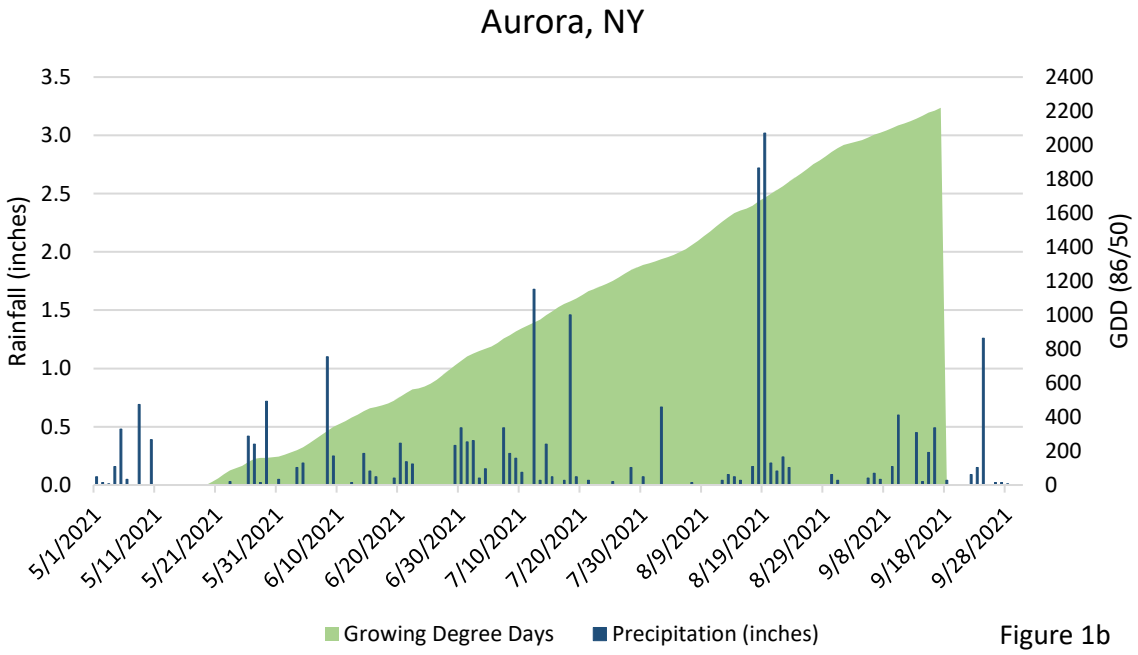


Figure 1b

Figure 1 (cont.)

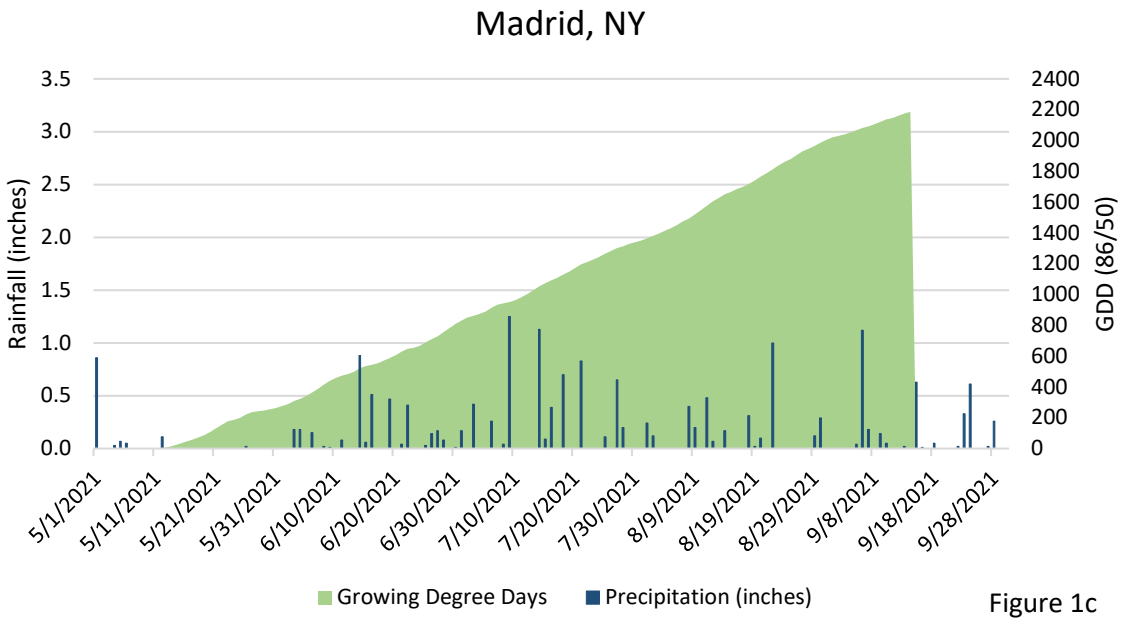


Figure 1c

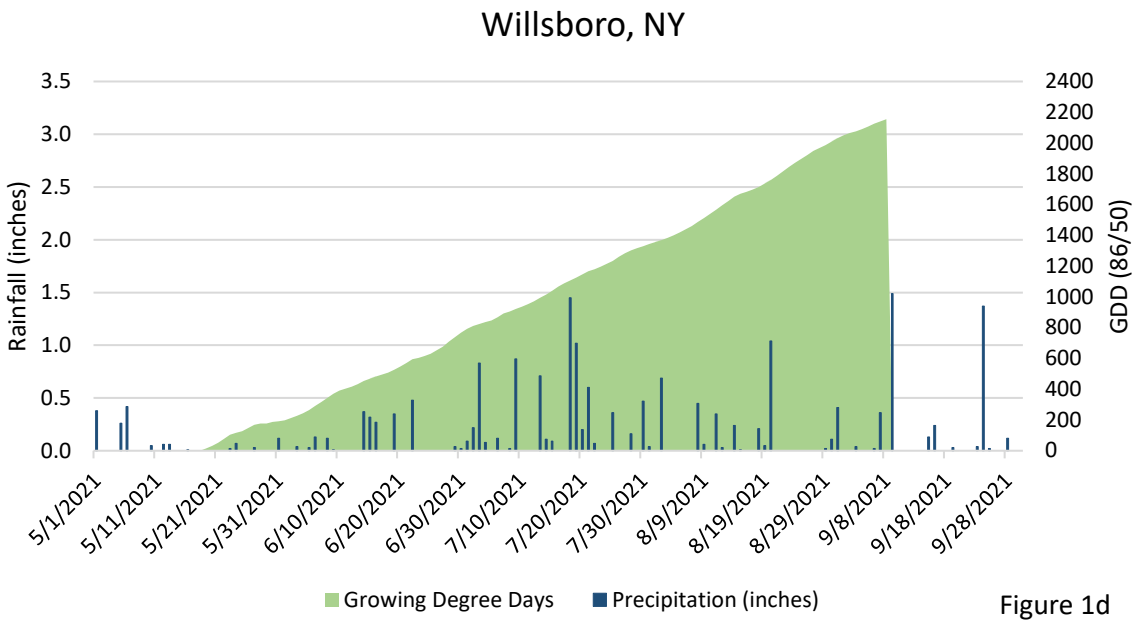


Figure 1d

Figure 1 (cont.)

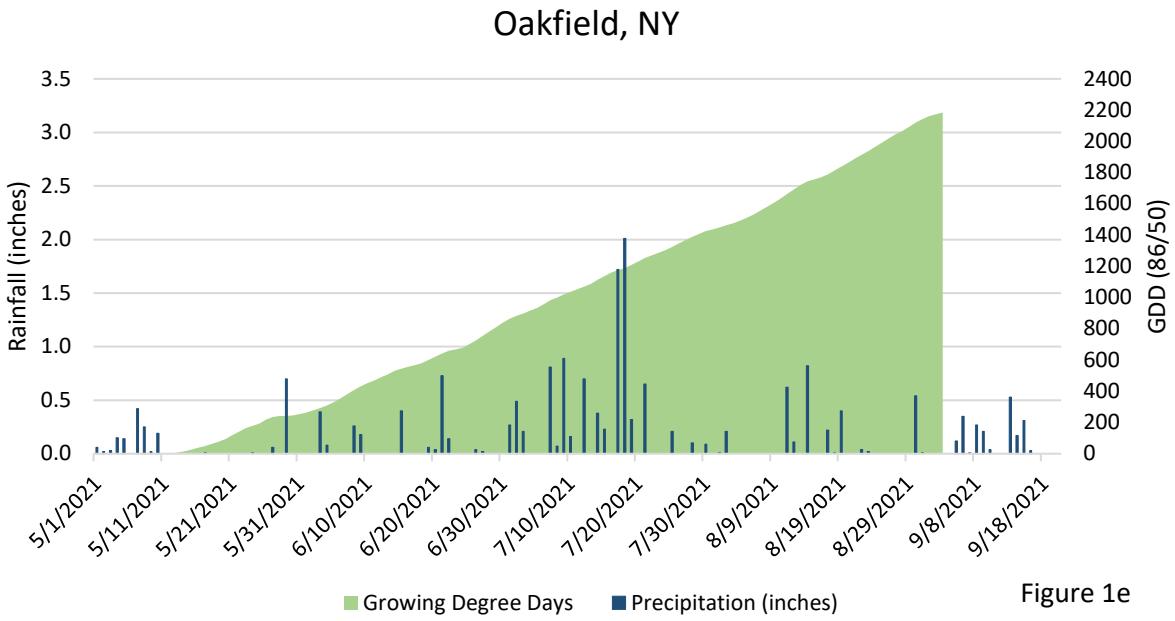
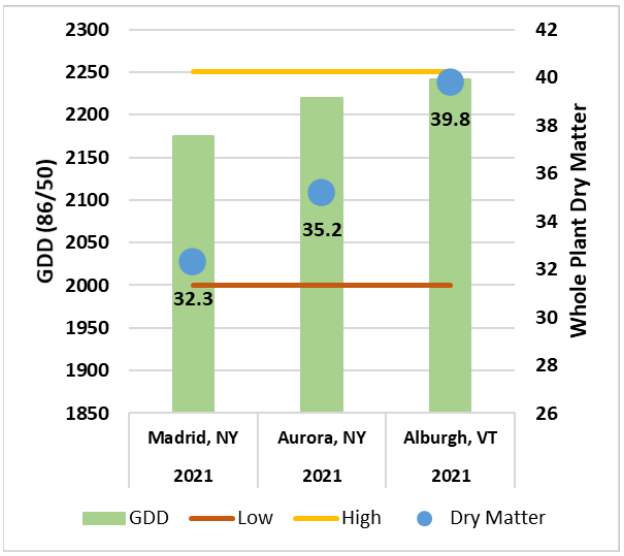


Figure 1e

Figure 2. Contrast of growing degree day (GDD) accumulation from planting to harvest with the overall average whole plant DM for all hybrids grown at a given location.



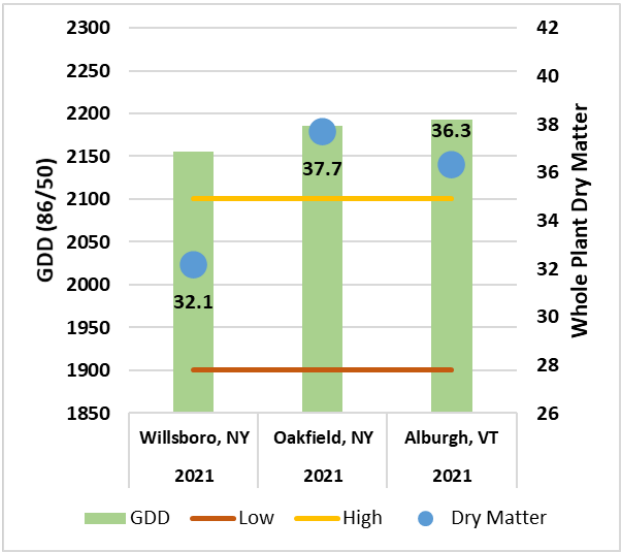


Figure 3: Summary of precipitation and growing degree day (GDD) data (Figure 3a and 3b, respectively) for 2021 in comparison to previous growing seasons.

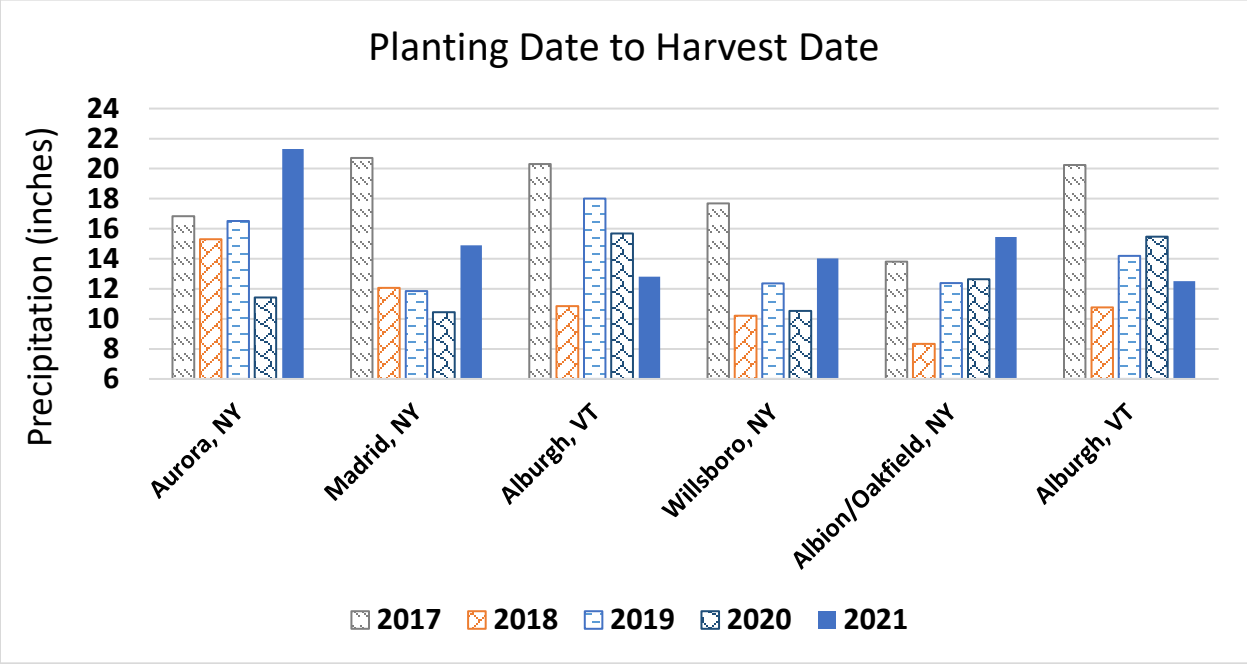


Figure 3a

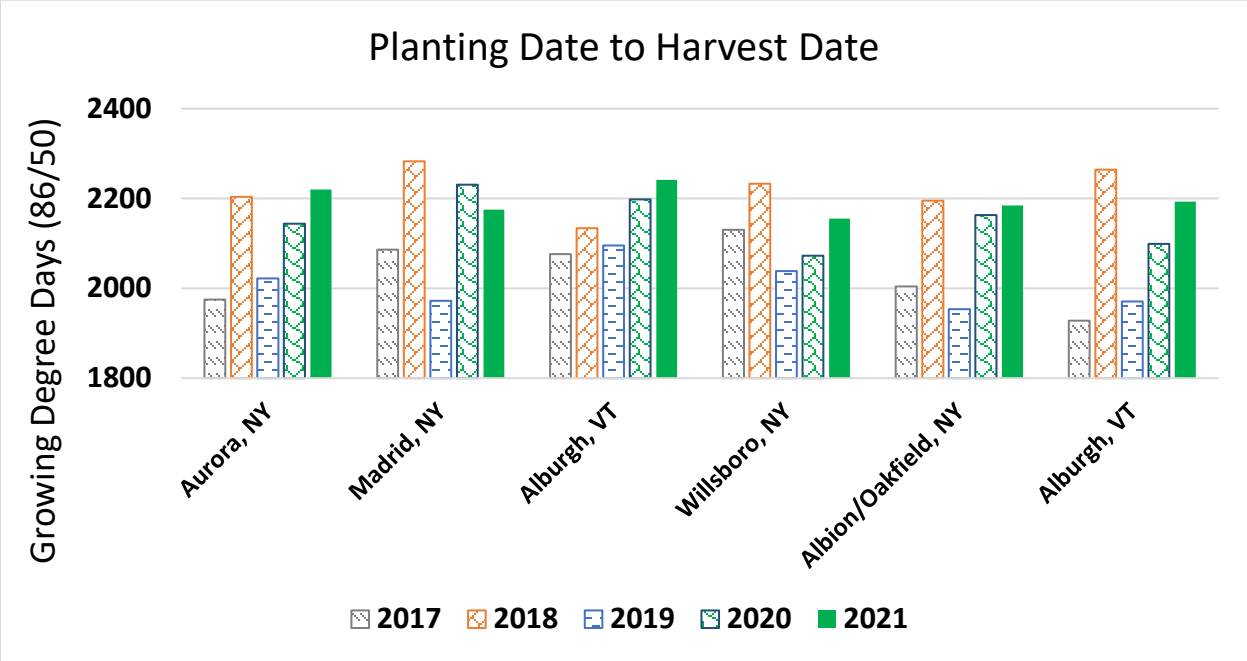


Figure 3b

Figure 4: The proportion of samples within different ranges of uNDF240 (Figure 4a) and starch (Figure 4b) combined across locations for the current year and previous growing seasons.

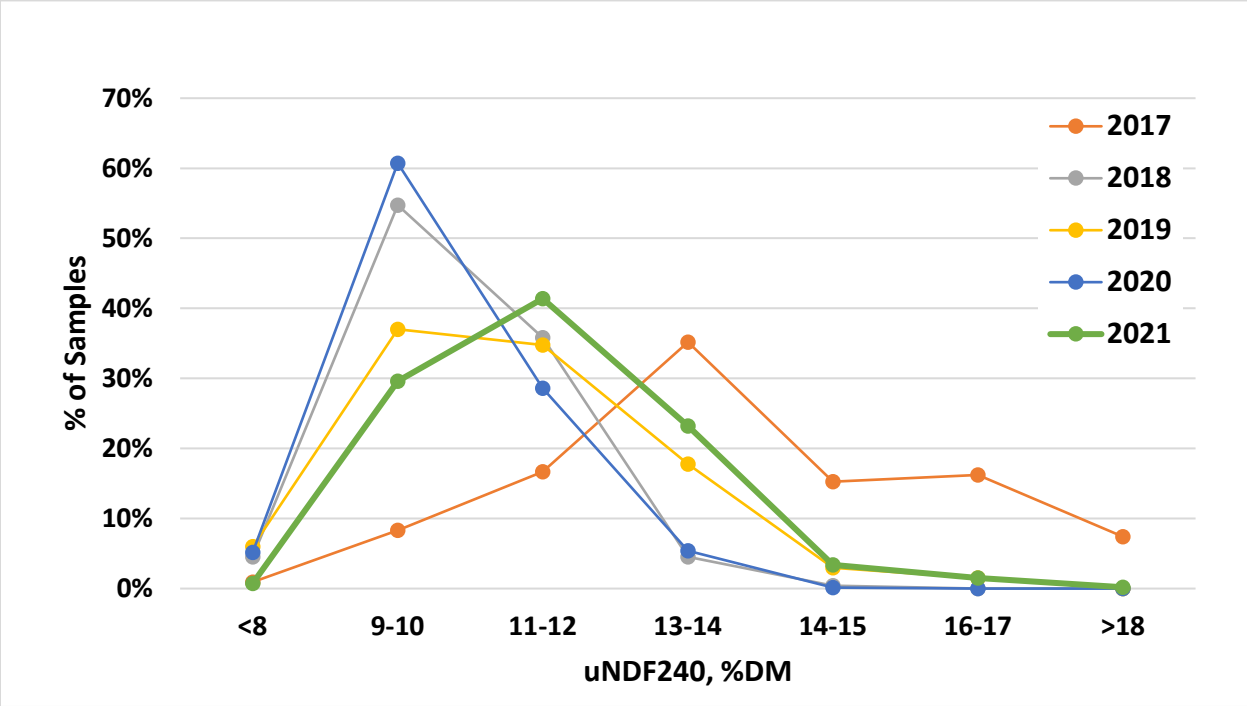


Figure 4a

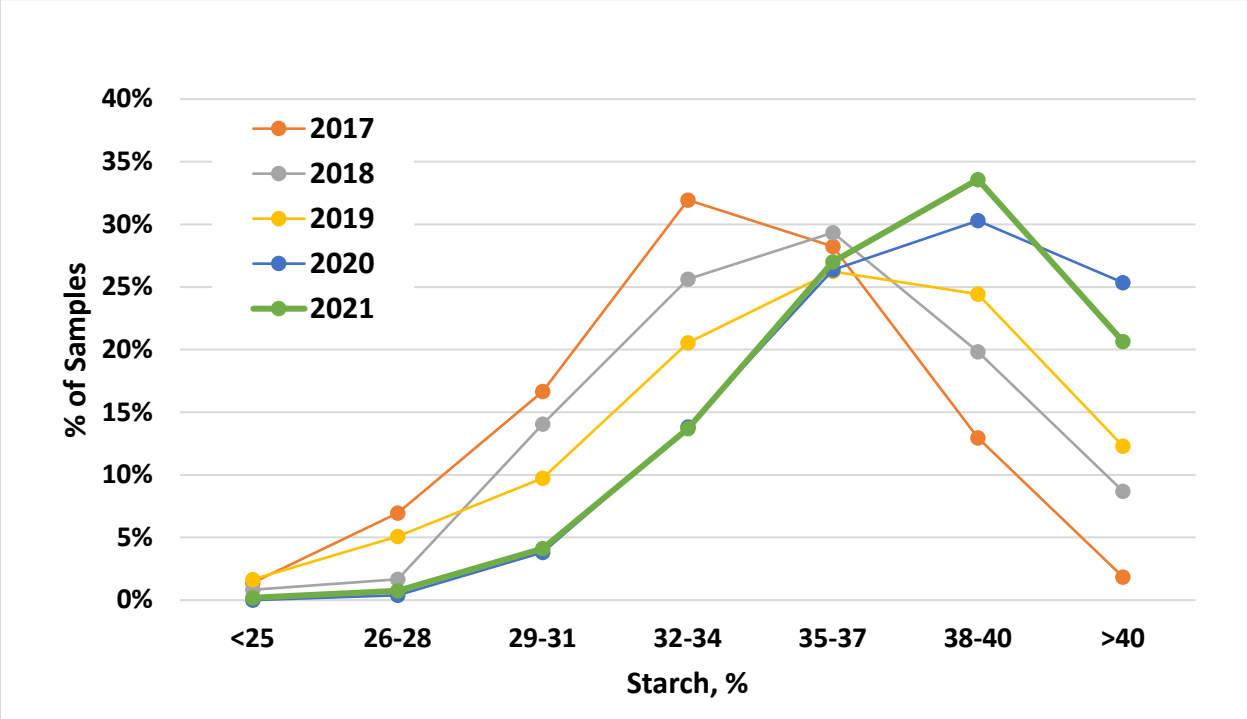


Figure 4b

Table 4:

Hybrid field and forage quality data for 80–95-day relative maturity (RM) hybrids planted at Oakfield, NY (4a), Willsboro, NY (4b) and Alburgh, VT (4c). Hybrids are sorted by dry matter content at harvest.

Table 5.

Hybrid field and forage quality data for 96–110-day relative maturity (RM) hybrids planted at Alburgh, VT (5a), Madrid, NY (5b), Aurora, NY (5c). Hybrids are sorted by dry matter content at harvest.

Tables 4 & 5: Least Significant Difference

Least significant difference (LSD) is used to indicate if the statistical difference between two values is meaningful at a certain confidence level. An LSD of 0.10 indicates a confidence level of 90%. The LSD value is presented at the base of the column for each hybrid parameter reported.

Footnotes for Tables 4 and 5.

* 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 ((NDFd30 + starch)/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 and was therefore removed for the harvest population and yield analysis.

[4] Missing data due to wildlife damage

† See Table 6: Trait Key

Table 4a: Hybrid traits and performance for 80 – 95-day RM groups at Oakfield, NY.

Company/Brand	Hybrid	Relative Maturity	Harvest Population	Dry Matter	Yield, 35% DM	Starch	Crude Protein	Lignin	C 18:2	12 hr NDFD	aNDFom	Wet Chem aNDFom	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 Predicted Allowable Milk Yield	CNCPS v. 7.0 Predicted Dry Matter Intake
			plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% NDF	% DM	% DM	% NDFom	% NDFom	% NDFom	% NDFom	% DM		lbs/day	lbs/day
Syngenta NK	NK9023-3220-EZ1	90	35357	34.3	30.2	38.3	8.4	2.9	1.26	34.9	34.4			54.7	61.6	64.1	12.3	3.6	88.8	54.0
Local Seed Company	LC9108 VT2PRIB	91	34687	36.3	30.3	39.5	7.4	2.8	1.20	37.7	34.3			56.3	63.8	66.6	11.5	3.9	99.3	58.3
Seedway	SW 2190GENSS (RIB)	83	33347	36.9	22.9	39.8	8.2	2.6	1.28	35.9	32.2			59.3	65.8	68.7	10.1	4.3	116.3	65.5
Seedway	SW9035VT	90	34855	37.0	29.8	39.9	7.7	2.7	1.24	36.2	33.1			56.3	64.2	67.0	11.0	3.9	102.6	59.3
Dekalb	DKC36-28RIB	86	34352	37.8	24.1	41.9	8.1	2.5	1.48	39.1	31.8			58.7	65.4	68.2	10.1	4.5	112.1	63.6
Brevant	B90R92Q	90	34855	38.1	32.8	42.6	8.1	2.6	1.37	36.9	31.0	31.0	61.0	55.4	63.9	66.6	10.4	4.3	106.7	60.8
Growmark FS	FS 4095X RIB	90	33514	38.1	28.9	40.7	7.6	2.6	1.29	37.2	32.6			58.0	65.0	67.8	10.5	4.2	110.6	62.6
Hubner	H4007RC2P	90	33849	38.9	27.6	42.1	7.4	2.7	1.30	37.0	33.0			56.2	63.7	66.3	11.1	4.1	105.4	60.6
Hubner	H4062RC2P	86	35357	39.5	29.4	42.0	7.5	2.7	1.37	36.0	32.7			56.4	64.1	66.8	10.9	4.1	104.8	60.6
Brevant	B85R88AM	85	33546	39.9	29.0	41.4	8.1	2.5	1.37	37.1	31.1	32.2	62.9	56.6	64.3	67.0	10.3	4.2	108.4	62.0
Seed Consultants	SC901Q	90	34855	39.9	28.8	43.3	7.4	2.3	1.23	38.9	30.7			59.7	68.5	71.5	8.8	4.8	117.8	65.4
Dekalb	DKC39-54RIB	89	33011	40.1	29.2	41.3	8.0	2.7	1.32	37.6	32.6			57.8	65.0	67.7	10.6	4.3	109.7	62.7
Seed Consultants	SC851AM	85	34855	40.3	27.9	39.1	8.4	2.7	1.26	39.0	33.0			56.9	64.1	66.7	11.0	4.0	106.4	61.4
Local Seed Company	LC8607 5222EZ	86	34352	40.9	27.7	37.2	8.4	2.8	1.28	38.1	34.9			57.7	63.0	65.7	12.0	3.8	95.1	56.5
	83-91 day	**RM Mean**	**34342**	**38.4**	**28.5**	**40.7**	**7.9**	**2.6**	**1.30**	**37.3**	**32.7**	**31.6**	**62.0**	**57.2**	**64.5**	**67.2**	**10.8**	**4.1**	**106.0**	**61.0**
RedTail-King's AgriSeed	RT 45T09-D2	95	33514	34.5	29.8	38.1	8.6	2.7	1.30	36.9	33.4			57.2	63.2	66.1	11.4	3.9	106.2	59.9
Dekalb	DKC45-94RIB	95	35190	34.8	29.3	37.5	7.9	2.7	1.24	38.0	36.0			59.5	67.4	70.1	10.7	3.9	106.6	61.5
Dekalb	DKC45-07RIB	95	34184	35.2	29.1	37.6	8.0	2.7	1.21	37.4	35.3			58.7	65.0	67.8	11.4	3.9	103.4	60.2
Growmark FS	FS 4303X RIB	93	32509	35.8	28.8	38.1	7.8	2.6	1.29	39.6	35.8			61.1	68.3	71.4	10.3	4.2	112.0	63.8
Dekalb	DKC42-04RIB	92	34352	36.4	28.9	40.0	7.4	2.8	1.24	36.3	34.7			56.3	64.1	66.9	11.5	3.8	95.5	56.8
RedTail-King's AgriSeed	RT 43T48	93	34184	36.6	29.4	39.3	8.8	2.7	1.38	36.4	33.3			56.8	62.6	65.3	11.6	4.0	101.8	58.3
Seedway	SW 3768GENSS (RIB)	95	35525	36.7	31.6	39.3	7.9	2.6	1.26	37.4	34.2			59.4	65.2	68.0	10.9	4.2	113.5	63.9
Syngenta NK	NK9535-3220-EZ1	95	33011	37.1	32.0	39.5	8.2	2.8	1.31	36.0	32.7			55.6	63.6	66.3	11.0	3.8	105.0	60.5
Seed Consultants	SC951Q	95	31503	37.2	26.4	42.2	7.7	2.3	1.27	39.2	31.1			61.2	70.1	73.0	8.4	4.8	121.4	66.8
Channel	193-91STXRIB	93	33849	37.3	29.5	39.9	7.8	2.5	1.21	39.0	33.7			60.2	68.6	71.5	9.6	4.3	113.1	64.0
Pioneer	P9492 AM	94	36363	37.6	33.0	41.0	8.1	2.4	1.30	37.3	31.6			59.4	66.6	69.4	9.7	4.4	116.5	65.4
Brevant	B95V86AM	95	35860	39.0	31.7	45.0	7.5	2.5	1.36	37.5	30.5	31.8	61.9	56.1	65.6	68.4	9.6	4.5	110.9	62.7
Seed Consultants	SC931Q	93	33011	40.6	28.1	40.7	7.8	2.7	1.20	36.4	32.1			57.5	65.2	68.0	10.3	4.1	109.4	62.5
	92-95 day	**RM Mean**	**34081**	**36.8**	**29.8**	**39.8**	**8.0**	**2.6**	**1.27**	**37.5**	**33.4**	**31.8**	**61.9**	**58.4**	**65.8**	**68.6**	**10.5**	**4.1**	**108.9**	**62.0**
	LSD (0.10)		**NS[2]**	**2.4**	**3.2**	**3.5**	**0.4**	**0.2**	**0.13**	**1.6**	**2.9**	**–**	**–**	**2.1**	**2.9**	**3.0**	**1.4**	**0.5**	**12.0**	**4.9**
	Overall Mean		**34217**	**37.7**	**29.1**	**40.3**	**7.9**	**2.6**	**1.29**	**37.4**	**33.0**	**31.7**	**62.0**	**57.7**	**65.1**	**67.9**	**10.6**	**4.1**	**107.4**	**61.5**

Table 4b: Hybrid traits and performance for 80 – 95-day RM groups at Willsboro, NY.

Company/Brand	Hybrid	Relative Maturity	Harvest Population	Dry Matter	Yield, 35% DM	Starch	Crude Protein	Lignin	C 18:2	12 hr NDFD	aNDFom	Wet Chem aNDFom	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 Predicted Allowable Milk Yield	CNCPS v. 7.0 Predicted Dry Matter Intake
			plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% NDF	% DM	% DM	% NDFom	% NDFom	% NDFom	% NDFom	% DM		lbs/day	lbs/day
Syngenta NK	NK9023-3220-EZ1	90	32670	28.9	23.6	35.3	8.8	3.1	1.13	34.3	36.5			55.3	66.5	69.4	11.2	3.2	97.4	58.6
Brevant	B90R92Q	90	30492	30.8	23.6	38.5	8.2	3.0	1.30	35.9	35.9	34.8	54.7	54.7	66.0	69.0	11.2	3.5	98.8	58.8
Local Seed Company	LC8607 5222EZ [3]	86	32071	31.3	23.5	34.0	8.2	3.4	1.11	35.2	39.5			54.8	65.4	68.2	12.6	3.0	90.5	56.2
Local Seed Company	LC9108 VT2PRIB	91	31654	32.6	25.1	40.8	7.9	2.7	1.23	36.6	32.7			56.0	66.5	69.3	10.1	4.0	106.1	61.4
Growmark FS	FS 4095X RIB	90	29330	32.8	23.0	38.8	7.7	2.7	1.21	36.9	34.1			57.7	68.2	71.2	9.9	3.9	107.4	62.0
Hubner	H4062RC2P	86	32380	32.9	23.0	38.5	7.8	3.1	1.26	36.2	37.2			54.5	66.3	69.2	11.5	3.4	95.0	57.7
Brevant	B85R88AM	85	29476	33.0	21.9	43.3	8.0	2.7	1.37	37.1	32.1	33.1	57.6	56.7	69.4	72.4	8.9	4.2	109.6	62.9
Seed Consultants	SC901Q	90	34703	33.1	23.1	39.7	7.2	2.8	1.16	36.0	34.1			58.0	69.9	72.8	9.3	3.9	108.7	62.5
Seedway	SW 2190GENSS (RIB)[3]	83	28352	33.6	21.5	41.2	8.3	2.4	1.37	36.6	31.1			59.8	70.1	73.2	8.3	4.5	117.0	65.8
Seedway	SW9035VT	90	32525	33.9	22.6	41.4	7.8	2.8	1.31	36.1	32.6			55.8	66.3	69.1	10.1	4.0	105.7	61.2
Hubner	H4007RC2P	90	31944	34.6	24.4	44.1	7.5	2.7	1.30	35.2	30.8			56.4	68.6	71.5	8.8	4.3	110.8	63.3
Dekalb	DKC39-54RIB	89	29621	34.6	22.0	41.0	7.9	3.0	1.28	36.2	35.1			56.1	67.5	70.4	10.4	3.8	102.0	60.3
Seed Consultants	SC851AM	85	36010	34.8	24.6	38.4	8.1	3.0	1.15	36.2	34.8			54.2	64.8	67.6	11.3	3.5	94.7	57.0
Dekalb	DKC36-28RIB [4]	86	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	83-91 day	**RM Mean**	**31633**	**32.8**	**23.2**	**39.6**	**8.0**	**2.9**	**1.25**	**36.0**	**34.4**	**33.9**	**56.2**	**56.2**	**67.4**	**70.2**	**10.3**	**3.8**	**103.4**	**60.6**
RedTail-King's AgriSeed	RT 45T09-D2	95	31799	28.4	23.7	34.7	8.1	3.3	1.19	33.8	37.5			53.9	65.2	68.1	11.9	3.1	91.7	56.3
Seed Consultants	SC951Q	95	29911	29.4	23.5	37.3	8.3	2.7	1.18	36.8	34.4			59.3	70.9	73.9	9.0	3.8	110.8	63.7
Seedway	SW 3768GENSS (RIB)	95	30782	30.6	21.8	35.6	8.4	3.1	1.11	34.7	36.9			56.5	66.6	69.5	11.3	3.3	98.6	59.0
Syngenta NK	NK9535-3220-EZ1	95	30928	30.8	26.0	38.0	7.9	3.0	1.20	34.9	34.3			53.7	64.7	67.5	11.2	3.4	99.1	58.7
Dekalb	DKC45-94RIB	95	31944	30.9	24.7	36.5	8.0	2.9	1.19	36.1	35.6			57.9	68.7	71.7	10.1	3.6	105.4	61.5
Dekalb	DKC45-07RIB	95	32034	31.0	24.1	38.3	8.3	2.8	1.24	36.1	35.0			57.7	68.6	71.5	10.0	3.7	105.2	61.5
RedTail-King's AgriSeed	RT 43T48	93	30347	31.3	25.8	39.7	8.5	2.8	1.33	35.6	33.7			55.9	66.1	68.8	10.5	3.9	103.9	60.8
Pioneer	P9492 AM	94	31363	32.0	23.5	38.8	7.7	2.8	1.17	38.1	35.0			58.0	70.0	72.9	9.5	3.9	107.2	62.1
Dekalb	DKC42-04RIB	92	30782	32.5	23.6	39.0	7.4	3.0	1.17	35.3	35.5			55.4	66.3	69.2	10.9	3.6	100.5	59.2
Channel	193-91STXRIB	93	32380	32.5	23.0	38.9	8.1	2.7	1.23	35.8	33.4			59.0	68.9	71.7	9.5	4.0	110.3	63.4
Brevant	B95V86AM	95	31654	32.7	25.3	42.2	7.6	2.8	1.23	35.6	33.2	33.2	55.9	55.2	67.8	70.8	9.7	3.9	104.6	60.8
Seed Consultants	SC931Q	93	30056	34.2	22.8	42.1	7.7	2.8	1.29	35.9	32.9			54.9	66.8	69.7	10.0	3.9	103.5	60.6
Growmark FS	FS 4303X RIB [4]	93	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	92-95 day	**RM Mean**	**31165**	**31.4**	**24.0**	**38.4**	**8.0**	**2.9**	**1.21**	**35.7**	**34.8**	**33.2**	**55.9**	**56.4**	**67.5**	**70.4**	**10.3**	**3.7**	**103.4**	**60.6**
	LSD (0.10)		**3117**	**1.8**	**NS[2]**	**3.3**	**0.5**	**0.3**	**0.13**	**1.6**	**3.2**	**–**	**–**	**2.7**	**2.4**	**2.5**	**1.5**	**0.5**	**9.9**	**3.8**
	Overall Mean		**31408**	**32.1**	**23.6**	**39.0**	**8.0**	**2.9**	**1.23**	**35.9**	**34.6**	**33.7**	**56.1**	**56.3**	**67.4**	**70.3**	**10.3**	**3.7**	**103.4**	**60.6**

Table 4c: Hybrid traits and performance for 80 – 95-day RM groups at Alburgh, VT.

Company/Brand	Hybrid	Relative Maturity	Harvest Population	Dry Matter	Yield, 35% DM	Starch	Crude Protein	Lignin	C 18:2	12 hr NDFD	aNDFom	Wet Chem aNDFom	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 Predicted Allowable Milk Yield	CNCPS v. 7.0 Predicted Dry Matter Intake
			plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% NDF	% DM	% DM	% NDFom	% NDFom	% NDFom	% NDFom	% DM		lbs/day	lbs/day
Seedway	SW 2190GENSS (RIB)	83	30034	34.1	16.9	31.9	9.7	3.3	1.14	34.8	39.0			53.3	62.8	65.5	13.5	2.8	75.3	49.6
Syngenta NK	NK9023-3220-EZ1	90	29997	34.2	20.1	35.8	8.8	3.2	1.29	32.9	37.9			50.5	61.0	63.6	13.9	2.9	71.0	47.2
Seed Consultants	SC901Q	90	30977	35.4	20.4	35.4	8.8	3.0	1.12	34.6	36.8			53.6	65.0	67.8	11.9	3.2	89.9	55.3
Growmark FS	FS 4095X RIB	90	30835	35.5	17.0	38.0	8.7	2.9	1.27	34.8	35.5			52.2	64.1	66.9	11.8	3.2	92.7	56.9
Dekalb	DKC36-28RIB	86	31048	35.6	15.0	36.1	9.5	3.0	1.27	34.5	36.3			53.1	63.1	65.9	12.5	3.2	83.9	52.9
Seedway	SW9035VT	90	29911	36.0	17.3	38.6	8.3	2.9	1.22	34.6	35.1			53.2	63.4	66.2	11.9	3.4	89.6	55.1
Local Seed Company	LC9108 VT2PRIB	91	30209	36.4	19.8	39.2	8.2	2.8	1.27	35.1	34.8			53.7	64.0	66.7	11.6	3.6	96.1	57.6
Hubner	H4007RC2P	90	31697	36.6	20.3	41.1	8.1	2.8	1.29	35.8	34.2			51.9	63.0	66.2	11.5	3.5	95.0	57.3
Brevant	B90R92Q	90	31373	37.0	21.5	39.2	8.3	2.9	1.30	34.9	34.6	35.0	56.2	52.3	63.8	66.6	11.6	3.4	94.9	57.2
Dekalb	DKC39-54RIB	89	29852	37.1	18.4	36.6	8.7	3.0	1.25	35.3	36.9			54.1	63.8	66.4	12.4	3.3	90.3	55.5
Seed Consultants	SC851AM	85	30486	37.9	19.9	35.7	8.8	3.1	1.19	34.9	37.9			51.3	63.2	66.0	12.9	3.0	82.1	52.2
Brevant	B85R88AM	85	30373	38.3	18.5	40.2	8.3	2.7	1.31	36.4	34.5	34.6	58.7	53.7	64.9	67.8	11.2	3.6	95.9	57.4
Hubner	H4062RC2P	86	29733	38.4	21.9	31.9	8.4	3.5	1.13	35.3	41.7			51.1	62.2	64.9	14.7	2.6	66.3	45.5
Local Seed Company	LC8607 5222EZ	86	30747	40.9	21.7	37.4	8.3	2.9	1.33	35.4	36.8			52.7	64.0	66.8	12.2	3.2	87.4	54.0
	83-91 day	**RM Mean**	**30519**	**36.7**	**19.2**	**36.9**	**8.6**	**3.0**	**1.24**	**34.9**	**36.6**	**34.8**	**57.4**	**52.6**	**63.4**	**66.2**	**12.4**	**3.2**	**86.5**	**53.8**
Dekalb	DKC45-07RIB	95	30680	32.7	17.8	36.9	8.6	2.9	1.21	35.8	37.4			54.3	65.7	68.5	11.8	3.3	93.7	57.3
Dekalb	DKC45-94RIB	95	31531	33.1	23.8	34.6	7.9	3.1	1.12	35.0	39.5			52.9	64.6	67.4	12.9	2.9	83.3	52.9
Seed Consultants	SC951Q	95	30212	33.4	17.0	35.5	8.3	2.9	1.14	37.3	38.2			54.6	67.0	69.8	11.5	3.2	93.9	57.3
Seedway	SW 3768GENSS (RIB)	95	30390	35.1	19.5	40.8	8.2	2.7	1.27	35.5	33.9			54.0	65.2	68.1	10.8	3.7	98.7	58.8
Channel	193-91STXRIB	93	31073	35.3	18.5	37.5	8.5	2.7	1.22	36.3	35.4			56.0	66.8	69.7	10.7	3.6	100.1	59.8
Dekalb	DKC42-04RIB	92	31261	35.7	21.3	41.9	8.1	2.8	1.31	33.7	33.4			52.9	65.0	67.9	10.7	3.7	98.0	58.4
RedTail-King's AgriSeed	RT 45T09-D2	95	30809	36.3	20.2	39.7	7.7	3.0	1.23	33.8	35.8			51.7	63.1	65.8	12.2	3.3	86.8	53.6
Growmark FS	FS 4303X RIB	93	30287	37.0	20.9	40.9	8.3	2.7	1.36	37.0	34.3			53.0	66.1	68.8	10.7	3.6	97.7	58.5
Seed Consultants	SC931Q	93	30717	37.2	17.8	37.9	8.2	2.9	1.20	36.9	37.0			52.2	64.7	67.4	12.0	3.2	91.8	56.1
Pioneer	P9492 AM	94	32525	37.3	20.5	42.0	7.9	2.6	1.39	36.6	33.0			52.6	65.3	68.1	10.6	3.7	98.4	58.9
Brevant	B95V86AM	95	31508	37.4	22.9	39.7	7.6	3.0	1.22	35.2	36.5	36.5	56.1	50.3	64.2	66.9	12.1	3.1	89.6	55.3
RedTail-King's AgriSeed	RT 43T48	93	30492	38.0	23.5	39.0	8.1	3.1	1.32	34.1	36.3			50.2	61.9	64.5	12.9	3.1	80.8	51.2
Syngenta NK	NK9535-3220-EZ1	95	30056	38.3	23.7	43.5	8.3	2.5	1.43	36.4	31.0			53.0	65.0	67.8	10.0	4.1	103.7	60.5
	92-95 day	**RM Mean**	**30888**	**35.9**	**20.6**	**39.2**	**8.1**	**2.8**	**1.26**	**35.7**	**35.5**	**36.5**	**56.1**	**52.9**	**65.0**	**67.7**	**11.5**	**3.4**	**93.6**	**56.8**
	LSD (0.10)		**NS[2]**	**2.8**	**3.7**	**4.3**	**0.6**	**0.3**	**0.14**	**2.0**	**3.1**	**–**	**–**	**2.6**	**NS**	**NS**	**1.7**	**0.5**	**14.7**	**6.1**
	Overall Mean		**30697**	**36.3**	**19.9**	**38.0**	**8.4**	**2.9**	**1.25**	**35.3**	**36.1**	**35.3**	**57.0**	**52.8**	**64.2**	**67.0**	**11.9**	**3.3**	**89.9**	**55.3**

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

Company/Brand	Hybrid	Relative Maturity	Harvest Population	Dry Matter	Yield, 35% DM	Starch	Crude Protein	Lignin	C 18:2	12 hr NDFD	aNDFom	Wet Chem aNDFom	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 Predicted Allowable Milk Yield	CNCPS v. 7.0 Predicted Dry Matter Intake
			plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% NDF	% DM	% DM	% NDFom	% NDFom	% NDFom	% NDFom	% DM		lbs/day	lbs/day
Hubner	H6134RCSS	96	32525	37.4	24.9	33.6	7.5	3.1	1.13	38.6	41.3			57.0	67.1	70.1	12.4	3.2	89.6	55.7
Growmark FS	FS 5090X RIB	100	32525	37.4	21.5	35.0	7.8	2.8	1.24	38.8	38.9			58.6	68.7	71.7	11.0	3.5	100.6	59.9
RedTail-King's AgriSeed	RT 51T57	101	30373	37.8	24.5	35.4	8.3	3.2	1.08	37.2	39.1			54.5	65.2	68.0	12.5	3.1	91.2	55.9
Local Seed Company	ZS9796 3220EZ	97	30868	39.0	22.2	34.0	7.3	3.3	1.17	36.5	40.6			53.2	63.7	66.4	13.7	2.9	76.2	49.8
Dekalb	DKC51-91RIB	101	31073	39.1	22.7	35.5	7.0	2.8	1.26	39.6	40.4			60.6	69.6	72.7	11.1	3.7	100.7	59.8
Dekalb	DKC50-87RIB	100	30492	39.6	25.3	39.3	7.6	3.1	1.28	35.4	37.3			52.8	63.2	65.9	12.7	3.3	86.2	53.4
Seed Consultants	SC1018AM	101	31218	40.5	27.5	37.1	7.6	2.8	1.25	40.9	39.5			59.4	70.1	73.2	10.6	3.7	101.2	60.1
Seedway	SW 0030SS	100	31654	40.6	24.1	34.8	7.2	3.1	1.18	38.6	40.8			56.8	67.1	69.9	12.3	3.2	91.9	56.8
Dyna-Gro	D40VC41	100	31944	42.6	25.0	38.5	7.0	2.9	1.29	38.1	37.4			56.7	67.1	70.0	11.2	3.6	98.4	58.7
Channel	199-11STXRIB	99	31363	42.6	23.1	37.0	7.3	2.9	1.31	37.7	38.4			56.8	66.8	69.7	11.6	3.5	97.2	58.2
Brevant	B97T04 SXE	97	37171	42.8	24.1	35.3	7.1	3.1	1.31	37.7	41.5	42.0	61.3	54.9	65.8	68.6	13.0	3.1	87.4	54.7
Growmark FS	FS 5101X RIB	101	32815	43.0	26.8	40.2	7.0	2.9	1.37	37.8	37.4			56.4	66.3	69.1	11.5	3.7	98.2	58.7
Seedway	SW 9839SS	98	31363	43.1	22.8	37.1	7.5	2.9	1.27	37.9	38.9			57.0	66.7	69.5	11.9	3.5	91.8	56.1
Pioneer	P0035 Q	100	31654	43.3	25.1	39.8	7.1	2.7	1.25	40.6	37.3			58.8	69.3	72.3	10.3	3.9	104.3	61.0
Channel	197-21VT2PRIB	97	31363	44.5	26.7	42.1	7.2	2.8	1.38	38.2	36.1			56.7	66.4	69.2	11.2	4.0	96.3	57.5
Seedway	SW 9504VT	96	32234	46.1	26.8	39.9	7.3	2.9	1.23	36.7	36.8			55.2	65.7	68.7	11.6	3.6	96.8	58.1
Channel	197-27STXRIB	97	31218	46.8	24.7	39.9	7.2	3.0	1.26	37.3	37.8			55.3	66.0	68.9	11.7	3.5	93.7	56.8
	96-101 day	**RM Mean**	**31874**	**41.5**	**24.6**	**37.3**	**7.4**	**3.0**	**1.25**	**38.1**	**38.8**	**42.0**	**61.3**	**56.5**	**66.7**	**69.6**	**11.8**	**3.5**	**94.2**	**57.1**
Dyna-Gro	D45TC55	105	31944	34.7	19.8	36.9	7.6	2.9	1.25	36.6	38.1			56.1	65.6	68.3	12.1	3.4	95.5	57.7
Seed Consultants	SC1071Q	107	30637	35.3	18.9	38.2	7.8	2.7	1.26	39.7	37.4			59.0	69.0	71.9	10.5	3.9	103.1	60.9
Channel	207-27STXRIB	107	30056	35.6	22.4	36.9	7.3	2.9	1.24	38.0	37.8			57.7	66.5	69.3	11.6	3.6	99.4	59.1
RedTail-King's AgriSeed	RT 54T13	104	30519	35.7	20.4	34.7	7.3	2.9	0.96	38.3	39.9			57.2	68.5	71.3	11.4	3.3	95.8	58.0
Dekalb	DKC59-07RIB	109	30782	35.8	26.8	37.5	7.7	2.7	1.26	38.9	36.9			58.9	68.5	71.5	10.6	3.9	103.8	61.0
Pioneer	P0732 Q	107	33396	36.1	22.4	36.8	7.5	2.8	1.22	39.4	38.2			58.4	68.8	71.8	10.8	3.7	99.7	60.1
Seed Consultants	SC1042Q	104	30868	36.8	24.8	39.9	7.9	2.7	1.44	38.7	34.9			57.8	67.4	70.3	10.4	4.0	103.2	60.4
Hubner	H6390RCSS	108	31654	37.2	23.4	38.6	7.6	2.7	1.32	38.4	36.8			58.4	68.2	71.2	10.6	3.8	103.1	60.7
Brevant	B02V87AMXT	102	31944	37.9	24.0	39.8	7.5	2.7	1.41	39.7	35.8	36.1	66.5	56.8	67.9	70.7	10.5	3.8	102.7	60.3
Dekalb	DKC58-64RIB	108	29766	38.0	22.0	35.8	7.9	2.9	1.20	38.0	38.8			58.0	66.5	69.3	11.8	3.5	98.4	58.9
Local Seed Company	LC0607 TC	106	31363	39.4	28.9	35.3	7.8	3.1	1.18	38.7	40.3			56.4	66.3	69.2	12.5	3.3	90.8	56.0
Syngenta NK	NK0243-5122-EZ1	102	30492	39.7	25.8	37.0	7.3	3.1	1.33	36.7	39.2			55.4	64.8	67.7	12.7	3.3	86.2	53.6
Hubner	H6225RCSS	102	31637	40.7	21.1	37.2	7.6	2.9	1.19	37.6	39.2			56.4	66.6	69.4	12.0	3.4	94.1	57.0
Dekalb	DKC56-65RIB	106	30928	40.9	23.5	36.0	7.3	3.0	1.16	38.6	40.2			57.1	66.9	69.8	12.2	3.4	92.1	56.5
Local Seed Company	ZS0398 5222EZ	103	32089	40.9	24.4	32.4	7.6	3.3	1.25	37.0	43.1			54.9	64.2	67.0	14.3	2.8	74.0	49.1
Channel	203-83STXRIB	103	32960	42.6	23.5	39.1	7.6	2.7	1.40	38.6	36.4			57.6	66.8	69.6	11.1	3.9	97.3	58.1
	102-109 day	**RM Mean**	**31315**	**38.0**	**23.3**	**37.0**	**7.6**	**2.9**	**1.25**	**38.3**	**38.3**	**36.1**	**66.5**	**57.3**	**67.0**	**69.9**	**11.6**	**3.6**	**96.2**	**58.0**
	LSD (0.10)		**NS[2]**	**4.1**	**4.2**	**3.9**	**0.5**	**0.3**	**0.14**	**1.5**	**NS**	**–**	**–**	**2.3**	**2.6**	**2.7**	**1.7**	**0.5**	**12.7**	**5.0**
	Overall Mean		**31603**	**39.8**	**23.9**	**37.2**	**7.5**	**2.9**	**1.25**	**38.2**	**38.6**	**39.0**	**63.9**	**56.9**	**66.9**	**69.8**	**11.7**	**3.5**	**95.2**	**57.5**

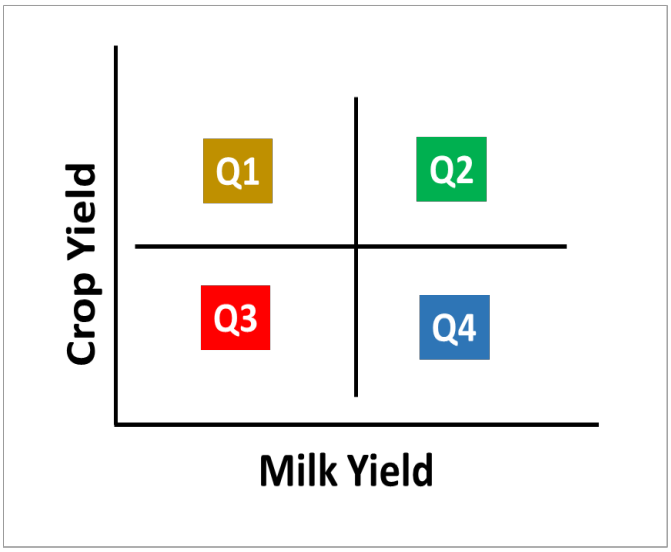
Table 5b: Hybrid traits and performance for 96–110-day RM groups at Madrid, NY.

Company/Brand	Hybrid	Relative Maturity	Harvest Population	Dry Matter	Yield, 35% DM	Starch	Crude Protein	Lignin	C 18:2	12 hr NDFD	aNDFom	Wet Chem aNDFom	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 Predicted Allowable Milk Yield	CNCPS v. 7.0 Predicted Dry Matter Intake
			plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% NDF	% DM	% DM	% NDFom	% NDFom	% NDFom	% NDFom	% DM		lbs/day	lbs/day
Growmark FS	FS 5090X RIB	100	35357	29.7	31.7	32.6	7.6	3.3	1.22	34.4	38.9			54.4	59.6	62.2	14.7	2.9	63.2	43.6
Seed Consultants	SC1018AM	101	36195	30.4	31.9	34.9	7.6	3.1	1.21	38.3	39.5			57.6	66.3	69.2	12.2	3.3	92.5	56.2
Brevant	B97T04 SXE	97	34017	31.8	31.2	33.3	7.2	3.5	1.28	34.3	42.7	41.8	58.6	52.2	62.2	64.8	15.1	2.8	61.4	43.8
Dekalb	DKC51-91RIB	101	34687	32.0	29.3	36.4	7.0	3.0	1.29	36.7	38.3			57.3	65.2	68.0	12.3	3.5	92.4	55.8
Pioneer	P0035 Q	100	36195	32.2	35.1	38.7	7.6	3.0	1.30	35.9	35.4			55.5	62.6	65.3	12.3	3.6	90.8	55.0
Seedway	SW 0030SS	100	36028	32.3	33.8	37.3	6.8	3.2	1.31	37.0	37.6			54.8	62.7	65.4	13.0	3.4	81.7	51.5
RedTail-King's AgriSeed	RT 51T57	101	34017	33.1	29.4	35.3	8.3	3.2	1.30	35.0	37.1			53.9	59.7	62.1	14.0	3.1	69.2	45.7
Seedway	SW 9839SS	98	35190	33.7	33.1	39.4	7.4	3.0	1.38	36.1	36.0			56.1	62.7	65.5	12.4	3.7	90.5	54.7
Local Seed Company	ZS9796 3220EZ	97	35190	34.0	30.5	37.0	7.3	3.5	1.36	33.8	37.8			50.6	57.9	60.3	15.0	2.9	57.2	41.7
Growmark FS	FS 5101X RIB	101	36866	34.1	35.9	39.9	6.9	2.9	1.37	37.4	35.2			56.3	64.0	66.8	11.7	3.8	98.4	58.1
Hubner	H6134RCSS	96	34520	34.3	32.1	40.7	7.4	2.8	1.42	37.5	34.6			57.1	64.8	67.5	11.3	4.0	98.3	57.9
Channel	199-11STXRIB	99	36195	34.5	30.8	37.6	6.6	3.1	1.37	36.5	38.8			55.9	63.4	66.3	13.1	3.4	83.1	52.3
Dyna-Gro	D40VC41	100	36698	34.6	35.8	40.8	6.3	2.9	1.40	36.7	35.3			56.0	63.9	66.7	11.8	3.8	94.5	56.8
Dekalb	DKC50-87RIB	100	34855	35.1	32.9	39.7	7.3	3.3	1.33	33.4	36.3			51.2	57.8	60.4	14.4	3.3	64.0	43.9
Channel	197-21VT2PRIB	97	33347	36.1	31.2	37.8	6.9	3.1	1.30	36.1	38.2			56.0	63.1	65.8	13.1	3.4	82.8	51.8
Channel	197-27STXRIB	97	36195	36.1	31.2	39.9	7.1	3.1	1.30	34.9	36.7			54.2	61.9	64.7	12.9	3.5	83.2	51.7
Seedway	SW 9504VT	96	37368	37.8	34.9	43.9	7.0	2.7	1.43	35.9	32.9			56.6	63.9	66.6	11.0	4.3	101.1	58.8
	96-101 day	**RM Mean**	**35466**	**33.6**	**32.4**	**37.9**	**7.2**	**3.1**	**1.33**	**35.9**	**37.1**	**41.8**	**58.6**	**55.0**	**62.4**	**65.2**	**13.0**	**3.5**	**82.6**	**51.7**
Dekalb	DKC58-64RIB	108	36363	28.0	32.0	33.2	7.9	3.4	1.24	32.3	38.5			54.0	59.7	62.3	14.5	2.9	65.0	44.2
Pioneer	P0732 Q	107	37201	29.0	34.7	34.7	7.9	3.1	1.20	35.2	37.8			56.3	64.0	66.7	12.6	3.2	88.4	54.3
Hubner	H6390RCSS	108	36363	29.0	33.2	34.7	8.1	3.1	1.28	34.7	37.3			56.6	62.5	65.1	13.0	3.3	82.5	51.5
Seed Consultants	SC1071Q	107	36698	29.1	35.7	35.8	8.5	3.0	1.31	35.8	36.0			57.0	64.0	66.7	12.0	3.5	91.7	55.4
RedTail-King's AgriSeed	RT 54T13	104	35022	29.4	31.1	32.4	7.4	3.4	1.08	34.8	40.6			54.3	62.0	64.7	14.4	2.8	69.0	46.4
Dekalb	DKC59-07RIB	109	35525	29.6	32.8	32.2	7.5	3.2	1.26	36.3	40.2			57.3	63.0	65.6	13.8	3.1	75.6	48.8
Syngenta NK	NK0243-5122-EZ1	102	35190	30.3	31.6	35.1	7.6	3.1	1.31	35.2	37.8			55.8	62.9	65.7	13.0	3.2	83.6	52.0
Seed Consultants	SC1042Q	104	36195	31.3	32.8	36.3	7.6	2.9	1.30	37.9	37.1			57.9	66.0	68.9	11.6	3.7	97.0	57.7
Dekalb	DKC56-65RIB	106	35190	31.5	31.6	38.8	8.2	2.9	1.35	36.6	35.1			56.6	63.6	66.3	11.8	3.7	97.4	57.7
Dyna-Gro	D45TC55	105	36866	31.8	31.2	35.4	7.4	3.2	1.25	34.2	38.7			54.5	62.7	65.3	13.5	3.2	78.5	50.6
Channel	207-27STXRIB	107	33849	31.8	31.2	37.5	7.1	2.8	1.30	35.7	36.0			57.9	63.4	66.1	12.2	3.7	93.3	55.8
Brevant	B02V87AMXT	102	35022	32.1	34.0	38.8	7.6	2.9	1.32	36.7	34.4	35.4	61.6	55.1	65.8	68.8	10.7	4.3	100.8	59.5
Channel	203-83STXRIB	103	37201	32.6	32.4	38.0	7.4	3.0	1.37	35.5	36.4			54.9	61.8	64.5	12.9	3.4	82.6	51.5
Hubner	H6225RCSS	102	35525	33.1	31.6	37.7	7.3	3.1	1.28	35.2	36.5			55.5	62.8	65.4	12.6	3.5	87.8	53.7
Local Seed Company	LC0607 TC	106	34436	33.7	32.8	39.3	7.5	2.9	1.42	35.8	35.5			56.5	62.5	65.1	12.4	3.8	89.1	54.1
Local Seed Company	ZS0398 5222EZ	103	34352	33.8	34.2	38.2	8.3	3.0	1.55	35.7	35.6			55.1	60.6	63.3	13.0	3.5	79.8	50.1
	102-109 day	**RM Mean**	**35687**	**31.0**	**32.7**	**36.1**	**7.7**	**3.1**	**1.30**	**35.5**	**37.1**	**35.4**	**61.6**	**56.0**	**63.0**	**65.7**	**12.8**	**3.4**	**85.1**	**52.7**
	LSD (0.10)		**2003**	**1.8**	**3.0**	**3.9**	**0.3**	**0.3**	**0.13**	**2.2**	**3.0**	**–**	**–**	**2.3**	**2.5**	**2.6**	**1.5**	**0.5**	**16.8**	**6.6**
	Overall Mean		**35573**	**32.4**	**32.5**	**37.1**	**7.4**	**3.1**	**1.32**	**35.7**	**37.1**	**38.6**	**60.1**	**55.5**	**62.7**	**65.4**	**12.9**	**3.4**	**83.8**	**52.2**

Table 5c: Hybrid traits and performance for 96–110-day RM groups at Aurora, NY.

Company/Brand	Hybrid	Relative Maturity	Harvest Population	Dry Matter	Yield, 35% DM	Starch	Crude Protein	Lignin	C 18:2	12 hr NDFD	aNDFom	Wet Chem aNDFom	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 Predicted Allowable Milk Yield	CNCPS v. 7.0 Predicted Dry Matter Intake
			plants/ac	%	tons/ac	% DM	% DM	% DM	% DM	% NDF	% DM	% DM	% NDFom	% NDFom	% NDFom	% NDFom	% DM		lbs/day	lbs/day
Seed Consultants	SC1018AM	101	35190	34.4	31.4	38.8	6.7	2.7	1.38	39.5	37.9			58.9	68.2	71.2	10.9	3.9	102.5	59.9
Hubner	H6134RCSS	96	37201	34.9	28.5	37.4	6.4	3.2	1.32	35.3	38.5			52.9	61.7	64.3	13.7	3.1	71.6	48.1
Growmark FS	FS 5090X RIB	100	35357	35.2	29.6	37.7	6.4	3.2	1.39	35.4	38.3			53.6	61.6	64.4	13.6	3.3	73.3	48.7
Dekalb	DKC51-91RIB	101	34520	35.2	28.1	40.9	6.5	2.7	1.42	36.8	34.5			58.0	66.4	69.2	10.6	4.1	98.4	58.1
Growmark FS	FS 5101X RIB	101	35525	35.5	30.1	37.9	6.0	3.2	1.33	35.4	39.1			53.6	63.0	65.6	13.4	3.2	74.9	50.0
Seedway	SW 0030SS	100	33849	35.9	29.5	38.8	6.1	3.2	1.36	35.2	38.4			53.5	62.8	65.5	13.3	3.3	78.8	51.2
Pioneer	P0035 Q	100	35693	36.0	31.0	39.3	6.1	2.9	1.30	37.5	36.7			55.4	63.6	66.4	12.3	3.6	91.0	55.5
Seedway	SW 9839SS	98	34520	36.4	28.4	38.5	6.4	3.1	1.39	34.3	37.5			55.4	62.3	65.1	13.1	3.5	81.7	52.0
Dekalb	DKC50-87RIB	100	34520	36.8	29.4	40.4	6.3	3.4	1.36	32.3	37.7			50.9	59.1	61.8	14.4	3.2	62.4	44.7
Dyna-Gro	D40VC41	100	37536	36.8	32.4	39.3	5.6	3.1	1.37	36.0	38.7			54.2	64.2	66.9	12.8	3.3	84.7	54.1
Channel	199-11STXRIB	99	37703	37.2	32.6	39.9	6.2	3.0	1.43	35.5	37.5			56.5	64.6	67.4	12.2	3.7	92.8	56.1
Local Seed Company	ZS9796 3220EZ	97	34855	37.6	29.1	39.2	6.2	3.4	1.36	32.5	37.7			49.3	57.9	60.9	14.7	3.0	56.8	42.9
Seedway	SW 9504VT	96	34352	37.8	29.8	38.4	6.1	3.4	1.23	33.7	38.4			50.2	60.9	63.6	14.0	3.0	68.5	47.5
RedTail-King's AgriSeed	RT 51T57	101	34184	37.9	26.6	36.8	6.9	3.2	1.31	34.7	39.0			53.5	61.9	64.5	14.0	3.2	72.5	48.2
Brevant	B97T04 SXE	97	35190	38.1	30.4	39.1	5.7	3.2	1.30	33.0	38.0	38.0	59.3	51.6	62.0	64.8	13.3	3.4	76.4	50.9
Channel	197-27STXRIB	97	36195	38.1	28.7	41.1	6.5	2.9	1.40	34.2	36.3			53.7	61.8	64.4	12.9	3.5	81.0	51.3
Channel	197-21VT2PRIB	97	36530	40.4	30.6	41.8	6.3	3.0	1.45	35.5	36.9			54.1	61.9	64.6	13.0	3.6	79.2	50.8
	96-101 day	**RM Mean**	**35466**	**36.7**	**29.8**	**39.1**	**6.3**	**3.1**	**1.36**	**35.1**	**37.7**	**38.0**	**59.3**	**53.8**	**62.6**	**65.3**	**13.1**	**3.4**	**79.2**	**51.2**
Seed Consultants	SC1042Q	104	35525	31.2	28.3	33.0	6.5	3.3	1.13	35.9	42.0			53.8	63.7	66.5	14.0	2.8	76.2	50.1
Hubner	H6390RCSS	108	35860	31.5	27.1	34.5	6.7	3.1	1.22	35.6	40.4			56.4	64.7	67.5	13.1	3.2	82.2	52.1
Seed Consultants	SC1071Q	107	35525	31.7	30.0	38.2	7.1	3.1	1.26	36.9	37.5			55.3	64.5	67.1	12.3	3.5	89.3	54.6
Dekalb	DKC59-07RIB	109	34352	31.7	29.0	34.5	6.4	3.4	1.16	34.5	40.5			52.9	62.0	64.8	14.2	2.9	67.0	46.6
Dekalb	DKC58-64RIB	108	34352	32.7	30.2	38.4	6.8	2.9	1.36	33.5	36.1			56.2	62.0	64.7	12.7	3.7	85.0	52.6
Pioneer	P0732 Q	107	35860	32.8	29.8	36.8	6.3	3.1	1.20	37.1	39.3			55.6	65.0	67.7	12.7	3.4	87.6	54.6
Hubner	H6225RCSS	102	36866	32.9	28.1	36.2	6.9	3.2	1.24	34.5	40.5			54.5	63.0	65.8	13.9	3.1	74.6	48.9
Dekalb	DKC56-65RIB	106	34687	33.3	26.4	34.3	6.5	3.3	1.24	35.1	41.3			52.8	60.9	63.6	15.1	2.8	59.0	43.4
Channel	207-27STXRIB	107	32676	33.4	28.0	37.7	6.4	3.0	1.38	35.3	37.6			56.2	63.8	66.6	12.6	3.5	88.0	54.3
Channel	203-83STXRIB	103	36195	33.8	27.1	36.9	6.4	2.9	1.37	35.7	38.7			55.8	63.3	66.2	13.1	3.3	82.8	52.3
RedTail-King's AgriSeed	RT 54T13	104	33179	33.9	29.3	34.4	6.1	3.5	1.07	35.7	42.3			53.5	62.2	64.8	14.9	2.9	64.5	46.0
Brevant	B02V87AMXT	102	34184	34.2	29.5	38.1	5.8	3.1	1.21	37.0	37.3	36.9	61.0	55.2	65.7	68.5	11.7	3.5	92.9	56.9
Syngenta NK	NK0243-5122-EZ1	102	35357	34.8	29.9	37.4	6.1	3.1	1.27	36.4	40.1			55.1	65.4	68.2	12.8	3.4	81.7	52.3
Dyna-Gro	D45TC55	105	36698	34.9	28.6	38.1	6.4	3.3	1.35	33.5	38.6			51.6	60.5	63.1	14.2	3.1	64.8	45.7
Local Seed Company	LC0607 TC	106	34520	36.1	30.7	37.2	6.2	3.2	1.24	34.7	39.5			52.5	60.5	63.2	14.5	3.0	63.1	45.2
Local Seed Company	ZS0398 5222EZ	103	35190	37.5	28.5	37.7	6.2	3.4	1.44	34.0	39.4			51.7	59.6	62.7	14.7	3.0	59.2	43.8
	102-109 day	**RM Mean**	**35064**	**33.5**	**28.8**	**36.5**	**6.4**	**3.2**	**1.26**	**35.3**	**39.4**	**36.9**	**61.0**	**54.3**	**62.9**	**65.7**	**13.5**	**3.2**	**76.1**	**50.0**
	LSD (0.10)		**1366**	**1.9**	**2.7**	**NS[2]**	**0.5**	**0.3**	**0.18**	**1.6**	**NS**	**–**	**–**	**2.3**	**2.8**	**2.9**	**1.8**	**0.5**	**20.0**	**7.5**
	Overall Mean		**35271**	**35.2**	**29.3**	**37.8**	**6.3**	**3.1**	**1.31**	**35.2**	**38.5**	**37.4**	**60.2**	**54.1**	**62.7**	**65.5**	**13.3**	**3.3**	**77.7**	**50.6**

Figure 5. Interpretation of quartile plots used in Figures 6 and 7.



Q1: Crop Yield: Above Average
Milk Yield: Below Average

Q2: Crop Yield: Above Average
Milk Yield: Above Average

Q3: Crop Yield: Below Average
Milk Yield: Below Average

Q4: Crop Yield: Below Average
Milk Yield: Above Average

Figure 6.

Relationship between crop yield and predicted milk yield (PMY) for 80–95-day relative maturity (RM) hybrids planted at Oakfield, NY (5a), Willsboro, NY (5b) and Alburgh, VT (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.

Figure 7.

Relationship between crop yield and predicted milk yield (PMY) for 96–110-day relative maturity (RM) hybrids planted at Alburgh, VT (6a), Madrid, NY (6b), Aurora, NY (6c). 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.

Figures 6 & 7: Least Significant Difference

Least significant difference (LSD) is used to indicate if the statistical difference between two values is meaningful at a certain confidence level. An LSD of 0.10 indicates a confidence level of 90%. In the figures 6 & 7 the LSD (0.10) is represented graphically as a way to visualize if the differences between hybrids is statistically significant.

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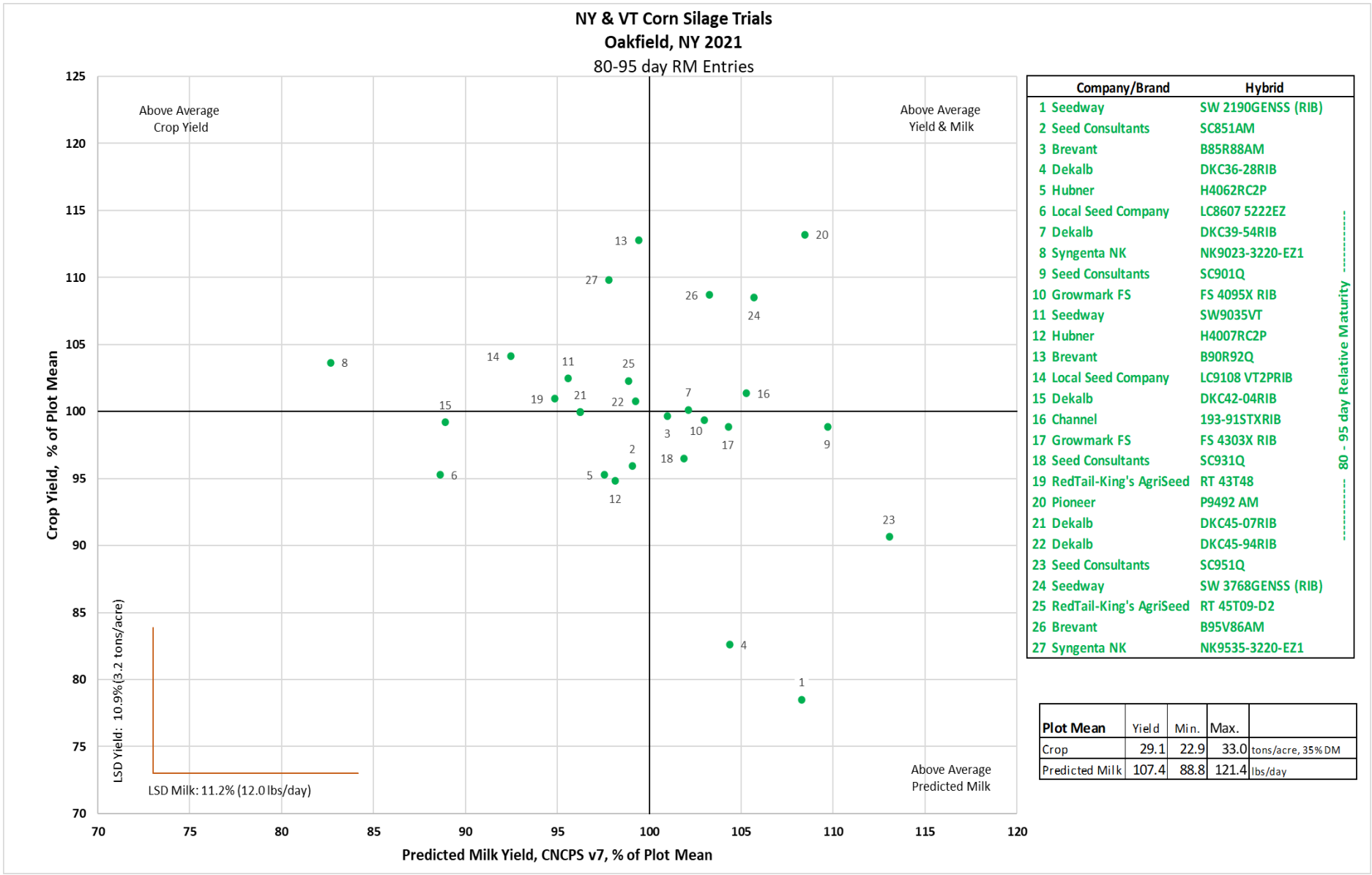
Figure 6a: Oakfield, NY 80–95-day RM hybrids.



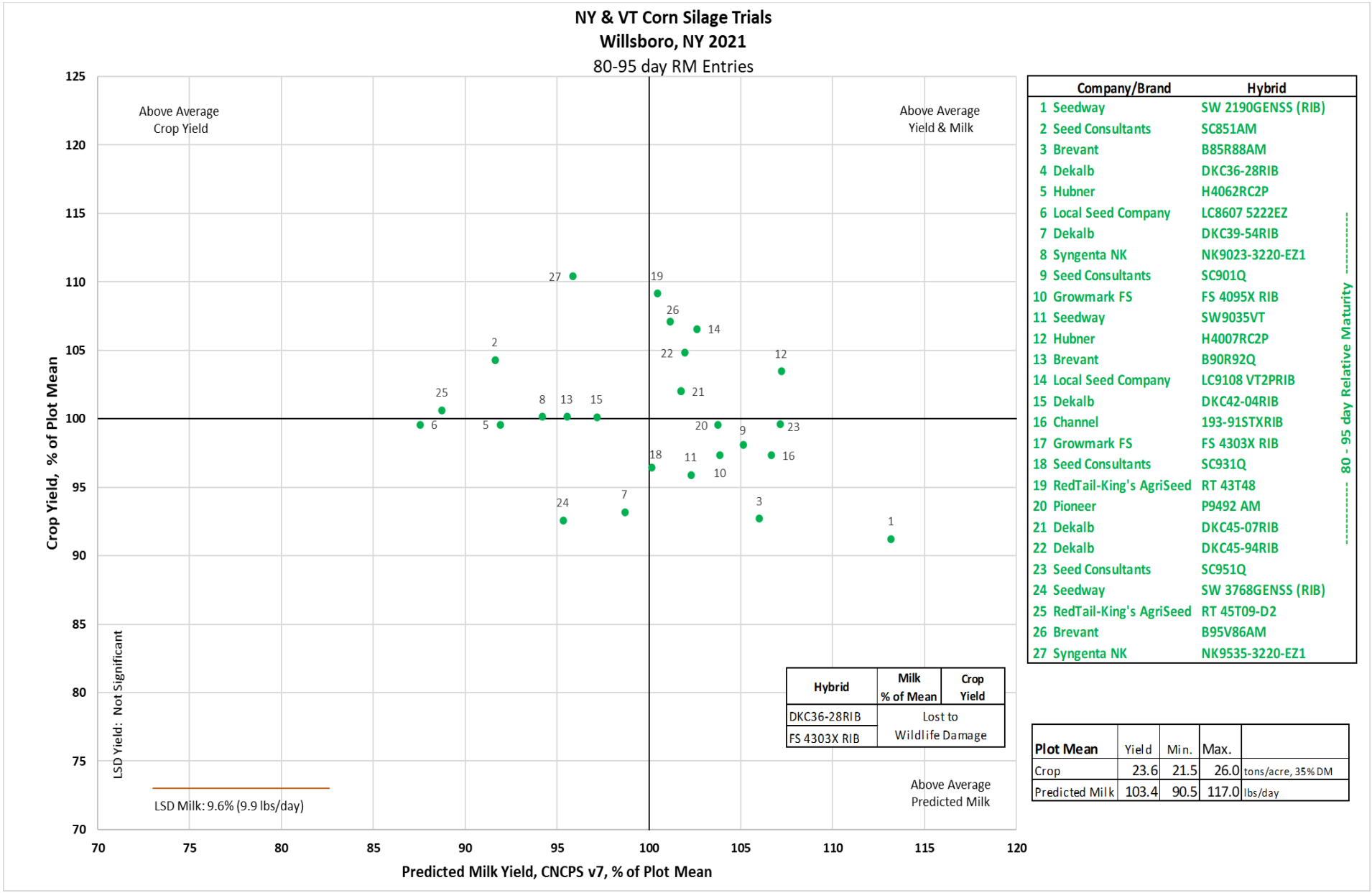
	Company/Brand	Hybrid
1	Seedway	SW 2190GENSS (RIB)
2	Seed Consultants	SC851AM
3	Brevant	B85R88AM
4	Dekalb	DKC36-28RIB
5	Hubner	H4062RC2P
6	Local Seed Company	LC8607 5222EZ
7	Dekalb	DKC39-54RIB
8	Syngenta NK	NK9023-3220-EZ1
9	Seed Consultants	SC901Q
10	Growmark FS	FS 4095X RIB
11	Seedway	SW9035VT
12	Hubner	H4007RC2P
13	Brevant	B90R92Q
14	Local Seed Company	LC9108 VT2PRIB
15	Dekalb	DKC42-04RIB
16	Channel	193-91STXRIB
17	Growmark FS	FS 4303X RIB
18	Seed Consultants	SC931Q
19	RedTail-King's AgriSeed	RT 43T48
20	Pioneer	P9492 AM
21	Dekalb	DKC45-07RIB
22	Dekalb	DKC45-94RIB
23	Seed Consultants	SC951Q
24	Seedway	SW 3768GENSS (RIB)
25	RedTail-King's AgriSeed	RT 45T09-D2
26	Brevant	B95V86AM
27	Syngenta NK	NK9535-3220-EZ1

80 - 95 day Relative Maturity

Plot Mean	Yield	Min.	Max.	
Crop	29.1	22.9	33.0	tons/acre, 35% DM
Predicted Milk	107.4	88.8	121.4	lbs/day

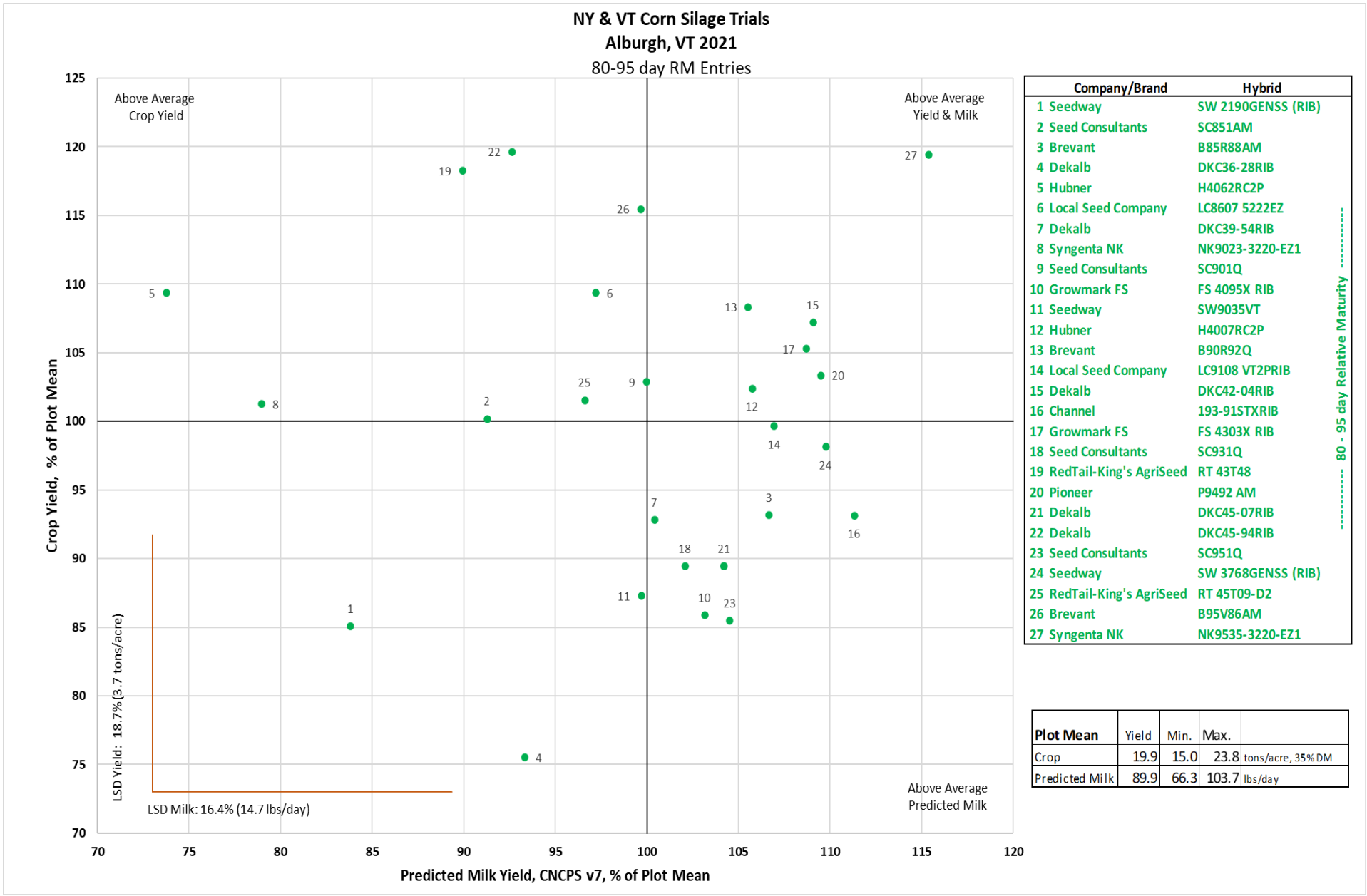
November 15, 2021

Figure 6b: Willsboro, NY 80–95-day RM hybrids.



November 15, 2021

Figure 6c: Alburgh, VT 80–95-day RM hybrids.



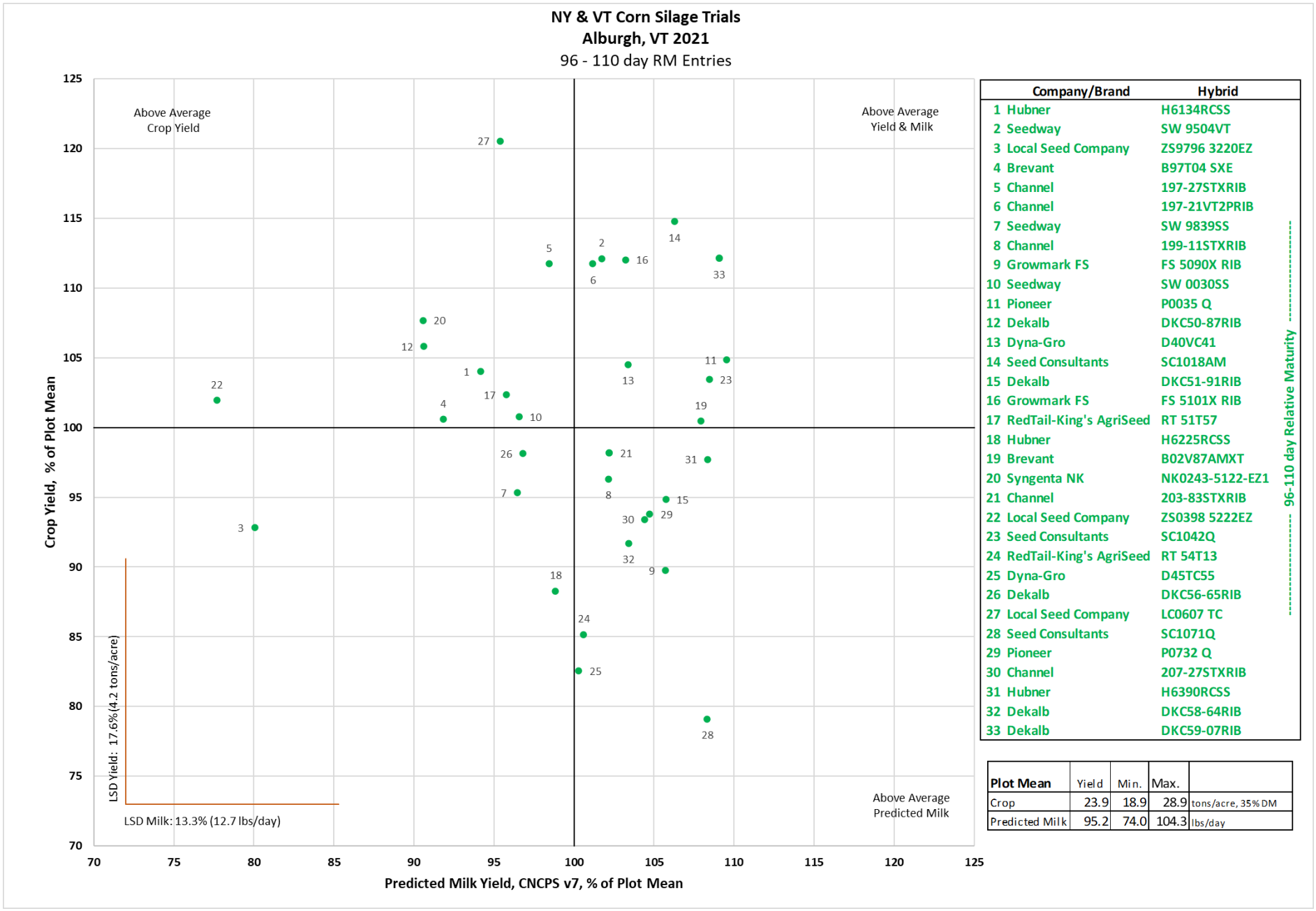
	Company/Brand	Hybrid
1	Seedway	SW 2190GENSS (RIB)
2	Seed Consultants	SC851AM
3	Brevant	B85R88AM
4	Dekalb	DKC36-28RIB
5	Hubner	H4062RC2P
6	Local Seed Company	LC8607 5222EZ
7	Dekalb	DKC39-54RIB
8	Syngenta NK	NK9023-3220-EZ1
9	Seed Consultants	SC901Q
10	Growmark FS	FS 4095X RIB
11	Seedway	SW9035VT
12	Hubner	H4007RC2P
13	Brevant	B90R92Q
14	Local Seed Company	LC9108 VT2PRIB
15	Dekalb	DKC42-04RIB
16	Channel	193-91STXRIB
17	Growmark FS	FS 4303X RIB
18	Seed Consultants	SC931Q
19	RedTail-King's AgriSeed	RT 43T48
20	Pioneer	P9492 AM
21	Dekalb	DKC45-07RIB
22	Dekalb	DKC45-94RIB
23	Seed Consultants	SC951Q
24	Seedway	SW 3768GENSS (RIB)
25	RedTail-King's AgriSeed	RT 45T09-D2
26	Brevant	B95V86AM
27	Syngenta NK	NK9535-3220-EZ1

---------- 80 - 95 day Relative Maturity ----------

Plot Mean	Yield	Min.	Max.	
Crop	19.9	15.0	23.8	tons/acre, 35% DM
Predicted Milk	89.9	66.3	103.7	lbs/day

November 15, 2021

Figure 7a: Alburgh, VT 96–110-day RM hybrids.

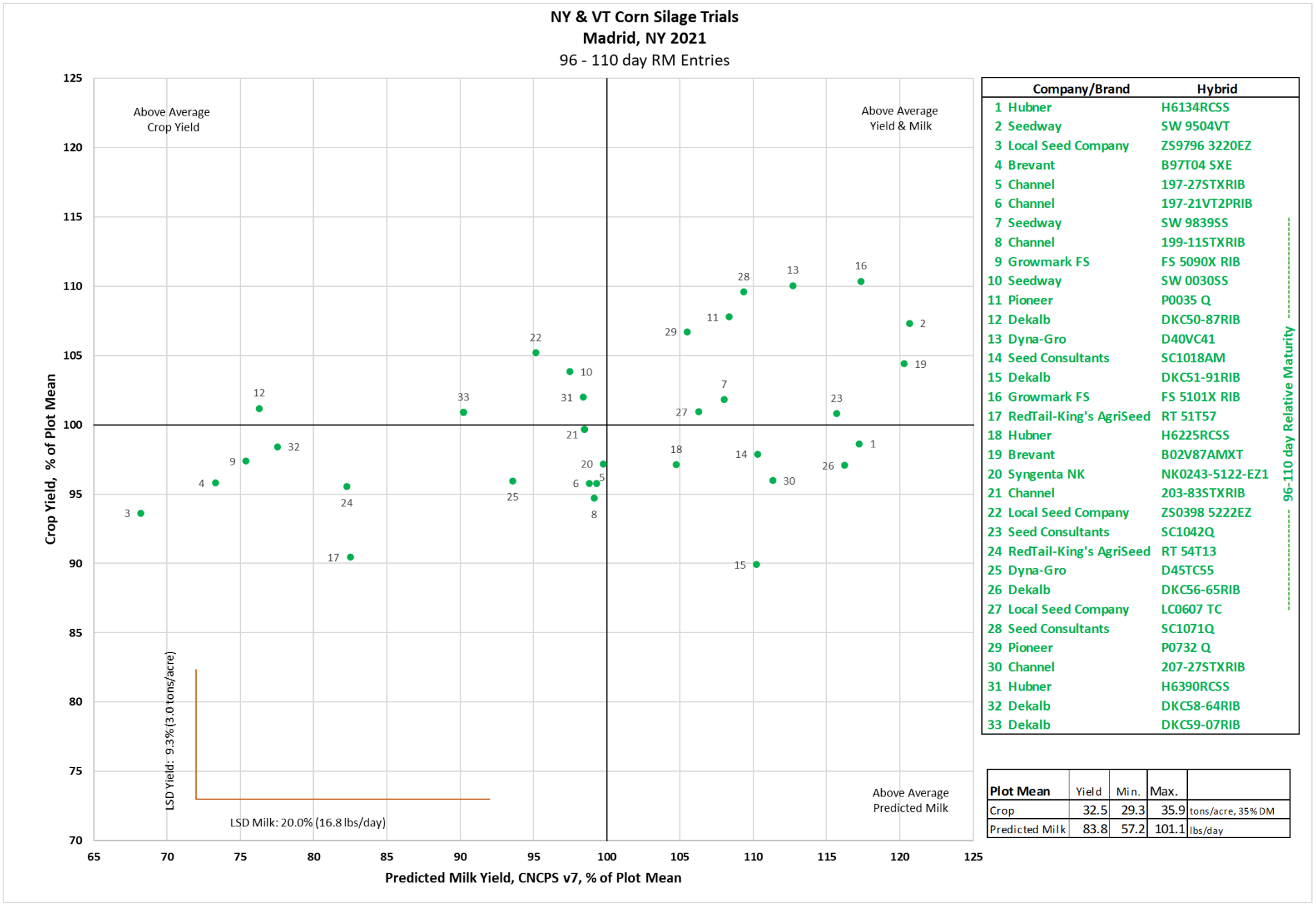


	Company/Brand	Hybrid
1	Hubner	H6134RCSS
2	Seedway	SW 9504VT
3	Local Seed Company	ZS9796 3220EZ
4	Brevant	B97T04 SXE
5	Channel	197-27STXRIB
6	Channel	197-21VT2PRIB
7	Seedway	SW 9839SS
8	Channel	199-11STXRIB
9	Growmark FS	FS 5090X RIB
10	Seedway	SW 0030SS
11	Pioneer	P0035 Q
12	Dekalb	DKC50-87RIB
13	Dyna-Gro	D40VC41
14	Seed Consultants	SC1018AM
15	Dekalb	DKC51-91RIB
16	Growmark FS	FS 5101X RIB
17	RedTail-King's AgriSeed	RT 51T57
18	Hubner	H6225RCSS
19	Brevant	B02V87AMXT
20	Syngenta NK	NK0243-5122-EZ1
21	Channel	203-83STXRIB
22	Local Seed Company	ZS0398 5222EZ
23	Seed Consultants	SC1042Q
24	RedTail-King's AgriSeed	RT 54T13
25	Dyna-Gro	D45TC55
26	Dekalb	DKC56-65RIB
27	Local Seed Company	LC0607 TC
28	Seed Consultants	SC1071Q
29	Pioneer	P0732 Q
30	Channel	207-27STXRIB
31	Hubner	H6390RCSS
32	Dekalb	DKC58-64RIB
33	Dekalb	DKC59-07RIB

Plot Mean	Yield	Min.	Max.	
Crop	23.9	18.9	28.9	tons/acre, 35% DM
Predicted Milk	95.2	74.0	104.3	lbs/day

November 15, 2021

Figure 7b: Madrid, NY 96–110-day RM hybrids.



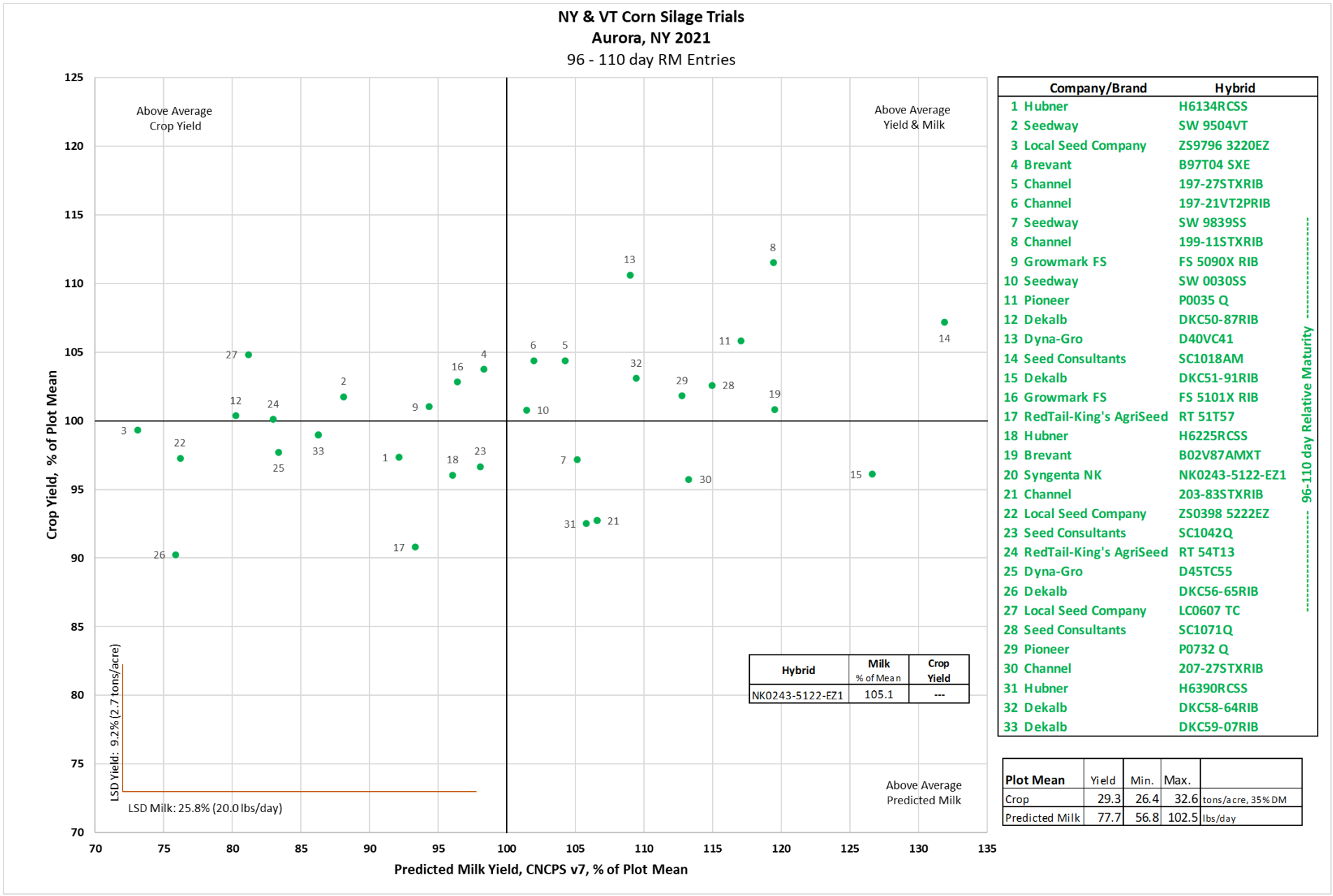
	Company/Brand	Hybrid
1	Hubner	H6134RCSS
2	Seedway	SW 9504VT
3	Local Seed Company	ZS9796 3220EZ
4	Brevant	B97T04 SXE
5	Channel	197-27STXRIB
6	Channel	197-21VT2PRIB
7	Seedway	SW 9839SS
8	Channel	199-11STXRIB
9	Growmark FS	FS 5090X RIB
10	Seedway	SW 0030SS
11	Pioneer	P0035 Q
12	Dekalb	DKC50-87RIB
13	Dyna-Gro	D40VC41
14	Seed Consultants	SC1018AM
15	Dekalb	DKC51-91RIB
16	Growmark FS	FS 5101X RIB
17	RedTail-King's AgriSeed	RT 51T57
18	Hubner	H6225RCSS
19	Brevant	B02V87AMXT
20	Syngenta NK	NK0243-5122-EZ1
21	Channel	203-83STXRIB
22	Local Seed Company	ZS0398 5222EZ
23	Seed Consultants	SC1042Q
24	RedTail-King's AgriSeed	RT 54T13
25	Dyna-Gro	D45TC55
26	Dekalb	DKC56-65RIB
27	Local Seed Company	LC0607 TC
28	Seed Consultants	SC1071Q
29	Pioneer	P0732 Q
30	Channel	207-27STXRIB
31	Hubner	H6390RCSS
32	Dekalb	DKC58-64RIB
33	Dekalb	DKC59-07RIB

96-110 day Relative Maturity

Plot Mean	Yield	Min.	Max.	
Crop	32.5	29.3	35.9	tons/acre, 35% DM
Predicted Milk	83.8	57.2	101.1	lbs/day

November 15, 2021

Figure 7c: Aurora, NY 96–110-day RM hybrids.



November 15, 2021

Table 6: Description of Seed Traits for hybrids listed in Tables 4 and 5.

Table 6a. 80 - 95-day Relative Maturity

Relative Maturity Group	Brand	Hybrid	Relative Maturity	Trait Package
80 - 95	Brevant	B85R88AM	85	AcreMax
80 - 95	Brevant	B90R92Q	90	Qrome
80 - 95	Brevant	B95V86AM	95	AcreMax
80 - 95	Channel	193-91STXRIB	93	STXRIB
80 - 95	Dekalb	DKC36-28RIB	86	SSRIB
80 - 95	Dekalb	DKC39-54RIB	89	SSRIB
80 - 95	Dekalb	DKC42-04RIB	92	SSRIB
80 - 95	Dekalb	DKC45-07RIB	95	SSRIB
80 - 95	Dekalb	DKC45-94RIB	95	SSRIB
80 - 95	Growmark FS	FS 4095X RIB	90	SmartStax
80 - 95	Growmark FS	FS 4303X RIB	93	SmartStax
80 - 95	Hubner	H4062RC2P	86	Double Pro
80 - 95	Hubner	H4007RC2P	90	Double Pro
80 - 95	Local Seed Company	LC8607 5222EZ	86	Agrisure 5222 Duracade
80 - 95	Local Seed Company	LC9108 VT2PRIB	91	VT2P
80 - 95	Pioneer	P9492 AM	94	AcreMax
80 - 95	RedTail-King's AgriSeed	RT 43T48	93	3220EZ
80 - 95	RedTail-King's AgriSeed	RT 45T09-D2	95	Duracade5222
80 - 95	Seed Consultants	SC851AM	85	AM - RR/LL
80 - 95	Seed Consultants	SC901Q	90	QROME - RR/LL
80 - 95	Seed Consultants	SC931Q	93	QROME - RR/LL
80 - 95	Seed Consultants	SC951Q	95	QROME - RR/LL
80 - 95	Seedway	SW 2190GENSS (RIB)	83	GENSS(RIB)
80 - 95	Seedway	SW9035VT	90	GENVT2P(RIB)
80 - 95	Seedway	SW 3768GENSS (RIB)	95	GENSS(RIB)
80 - 95	Syngenta NK	NK9023-3220-EZ1	90	Agrisure 3220
80 - 95	Syngenta NK	NK9535-3220-EZ1	95	Agrisure 3220

Table 6b. 96 - 110-day Relative Maturity

Relative Maturity Group	Brand	Hybrid	Relative Maturity	Trait Package
96 - 110	Brevant	B97T04 SXE	97	Smart Stax
96 - 110	Brevant	B02V87AMXT	102	Acre Max XT
96 - 110	Channel	197-21VT2PRIB	97	VT2PRIB
96 - 110	Channel	197-27STXRIB	97	STXRIB
96 - 110	Channel	199-11STXRIB	99	STXRIB
96 - 110	Channel	203-83STXRIB	103	STXRIB
96 - 110	Channel	207-27STXRIB	107	STXRIB
96 - 110	Dekalb	DKC50-87RIB	100	SSRIB
96 - 110	Dekalb	DKC51-91RIB	101	SSRIB
96 - 110	Dekalb	DKC56-65RIB	106	SSRIB
96 - 110	Dekalb	DKC58-64RIB	108	SSRIB
96 - 110	Dekalb	DKC59-07RIB	109	SSRIB
96 - 110	Dyna-Gro	D40VC41	100	VT2 PRO
96 - 110	Dyna-Gro	D45TC55	105	Trecepta
96 - 110	Growmark FS	FS 5090X RIB	100	SmartStax
96 - 110	Growmark FS	FS 5101X RIB	101	SmartStax
96 - 110	Hubner	H6134RCSS	96	SmartStax
96 - 110	Hubner	H6225RCSS	102	SmartStax
96 - 110	Hubner	H6390RCSS	108	SmartStax
96 - 110	Local Seed Company	ZS9796 3220EZ	97	Agrisure 3220 Viptera
96 - 110	Local Seed Company	ZS0398 5222EZ	103	grisure 5222 Duracade
96 - 110	Local Seed Company	LC0607 TC	106	Trecepta
96 - 110	Pioneer	P0035 Q	100	Qrome
96 - 110	Pioneer	P0732 Q	107	Qrome
96 - 110	RedTail-King's AgriSeed	RT 51T57	101	3122EZ
96 - 110	RedTail-King's AgriSeed	RT 54T13	104	3000GT
96 - 110	Seed Consultants	SC1018AM	101	AM - RR/LL
96 - 110	Seed Consultants	SC1042Q	104	QROME - RR/LL
96 - 110	Seed Consultants	SC1071Q	107	QROME - RR/LL
96 - 110	Seedway	SW 9504VT	96	GENVT2P(RIB)
96 - 110	Seedway	SW 9839SS	98	GENSS(RIB)
96 - 110	Seedway	SW 0030SS	100	GENSS(RIB)
96 - 110	Syngenta NK	NK0243-5122-EZ1	102	Agrisure 5122

Table 7: Trait descriptions

The Handy Bt Trait Table for U.S. Corn Production, updated MARCH 2021

Trait packages in alphabetical order (acronym that may be used)	**Bt protein(s) (or other trait) in package**	**Marketed for control of:** BCW	CEW	ECB	FAW	SB	SCB	SWCB	TAW	WBC	CR	**Resistance confirmed to the combination of Bts in package** (check local situation)	**Herbicide trait** GR	LL	E	**Non-Bt Refuge % (cornbelt)**
AcreMax (AM)	Cry1Ab Cry1F	x	x	x	x	x	x	x				CEW FAW WBC	x	x		5% in bag
AcreMax CRW (AMRW)	Cry34/35Ab1										x	NCR WCR	x	x		10% in bag
AcreMax1 (AM1)	Cry1F Cry34/35Ab1	x		x	x	x	x	x			x	ECB FAW SWB WBC NCR WCR	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 TRIsect (AMT)	Cry1Ab Cry1F mCry3A	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	x	x		10% in bag
AcreMax Xtra (AMX)	Cry1Ab Cry1F Cry34/35Ab1	x	x	x	x	x	x	x			x	CEW FAW WBC NCR WCR	x	x		10% in bag
AcreMax Xtreme (AMXT)	Cry1Ab Cry1F mCry3A Cry34/35Ab1	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	x	x		5% in bag
Agrisure 3010 (BR)	Cry1Ab		x	x			x	x				CEW	x	x		20%
Agrisure 3000GT & 3011A	Cry1Ab mCry3A		x	x			x	x			x	CEW WCR	x	x		20%
Agrisure Viptera 3110 (VR)	Cry1Ab Vip3A	x	x	x	x	x	x	x	x	x			x	x		20%
Agrisure Viptera 3111 (A4)	Cry1Ab Vip3A mCry3A	x	x	x	x	x	x	x	x	x	x	WCR	x	x		20%
Agrisure 3120 E-Z Refuge (BZ)	Cry1Ab Cry1F	x	x	x	x	x	x	x				CEW FAW WBC	x	See bag tag. EZ0=no EZ1=yes		5% in bag
Agrisure 3122 E-Z Refuge	Cry1Ab Cry1F mCry3A Cry34/35Ab1	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	x			5% in bag
Agrisure Viptera 3220 E-Z (VZ)	Cry1Ab Cry1F Vip3A	x	x	x	x	x	x	x	x	x			x			5% in bag
Agrisure Viptera 3330 E-Z	Cry1Ab Vip3A Cry1A.105/Cry2Ab2	x	x	x	x	x	x	x	x	x			x			5% in bag
Agrisure Duracade 5122 E-Z (D1)	Cry1Ab Cry1F mCry3A eCry3.1Ab	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	x			5% in bag
Agrisure Duracade 5222 E-Z (D2)	Cry1Ab Cry1F Vip3A mCry3A eCry3.1Ab	x	x	x	x	x	x	x	x	x	x	WCR	x			5% in bag
Agrisure Duracade 5332-E-Z	Cry1A.105/Cry2Ab2 Cry1Ab Vip3A mCry3A eCry3.1Ab	x	x	x	x	x	x	x	x	x	x	WCR	x			5% in bag
Herculex I (HXI)	Cry1F	x		x	x	x	x	x				ECB FAW SWB WBC	x	x		20%
Herculex RW (HXRW)	Cry34/35Ab1										x	NCR WCR	x	x		20%
Herculex XTRA (HXX)	Cry1F Cry34/35Ab1	x		x	x	x	x	x			x	ECB FAW SWB WBC NCR WCR	x	x		20%
Intrasect (YHR)	Cry1Ab Cry1F	x	x	x	x	x	x	x				CEW FAW WBC	x	x		5%
Intrasect TRIsect (CYHR)	Cry1Ab Cry1F mCry3A	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	x	x		20%
Intrasect Xtra (YXR)	Cry1Ab Cry1F Cry34/35Ab1	x	x	x	x	x	x	x			x	CEW FAW WBC NCR WCR	x	x		20%
Intrasect Xtreme (CYXR)	Cry1Ab Cry1F mCry3A Cry34/35Ab1	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	x	x		5%
Leptra (VYHR)	Cry1Ab Cry1F Vip3A	x	x	x	x	x	x	x	x	x			x	x		5%
Powercore [a] (PW) PW Refuge Advanced [b] (PWRA)	Cry1A.105/Cry2Ab2 Cry1F	x	x	x	x	x	x	x				CEW WBC	x	x		[a]5% [b]5% in bag
Powercore Enlist (PWE)	Same as Powercore	x	x	x	x	x	x	x				CEW WBC	x	x	x	5% in bag
QROME (Q)	Cry1Ab Cry1F mCry3A Cry34/35Ab1	x	x	x	x	x	x	x			x	CEW FAW WBC WCR	x	x		5% in bag
SmartStax [a] (SX,STX or SS) STX Refuge Advanced [b] (SXRA) STX RIB Complete [b] (STXRIB)	Cry1A.105/Cry2Ab2 Cry1F Cry3Bb1 Cry34/35Ab1	x	x	x	x	x	x	x			x	CEW WBC NCR WCR	x	x		[a]5% [b]5% in bag
SmartStax Enlist (SXE)	Same as SmartStax	x	x	x	x	x	x	x			x	Same as SmartStax	x	x	x	5% in bag
SmartStax Pro *2022 commercialization date	Same as SmartStax + DvSnf7 dsRNA	x	x	x	x	x	x	x			x	CEW WBC	x	x		5% in bag
Trecepta [a] (TRE) Trecepta RIB Complete [b] (TRERIB)	Cry1A.105/Cry2Ab2 Vip3A	x	x	x	x	x	x	x	x	x			x			[a]5% [b]5% in bag
TRIsect (CHR)	Cry1F mCry3A	x		x	x	x	x	x			x	ECB FAW SWB WBC WCR	x	x		20%
VT DoublePRO [a] (VT2P) VT2P RIB Complete[b] (VT2PRIB)	Cry1A.105/Cry2Ab2		x	x	x	x	x	x				CEW	x			[a]5% [b]5% in bag
VT TriplePRO [c] (VT3P) VT3P RIB Complete [d] (VT3PRIB)	Cry1A.105/Cry2Ab2 Cry3Bb1		x	x	x	x	x	x			x	CEW NCR WCR	x			[c]20% [D]10% in bag
Yieldgard Corn Borer (YGCB)	Cry1Ab		x	x			x	x				CEW	x			20%
Yieldgard Rootworm (YGRW)	Cry3Bb1										x	NCR WCR	x			20%
Yieldgard VT Triple (VT3)	Cry1Ab Cry3Bb1		x	x			x	x			x	CEW NCR WCR	x			20%

The latest version of the table is always posted at https://www.texasinsects.org/bt-corn-trait-table.html
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