

# Northern NY Agricultural Development Program 2011 Project Report

**Project Title:** Corn Hybrids for Grain Production in Northern New York

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**Background:**

Corn is the primary row crop grown in northern New York (NNY), harvested from about 140,000 acres in 2010. Jefferson and St. Lawrence counties rank in the top 10 NY counties in terms of corn acreage, and Clinton and Lewis counties are not far behind. Corn provides essential feed for the dairy industry in NNY. About 60,000 acres of corn were harvested as grain in 2010, representing 43% of total corn acreage in NNY. Although NNY corn grain acreage was down relative to silage acreage compared to 2009 values, grain acreage has consistently increased as a percentage of NNY corn acreage over the past decade (see Figure 1). With ethanol production facilities in NY operational, corn grain production and marketing opportunities for NNY farmers continue to grow. The grain produced by corn hybrids also is a major contributor to silage yield, so grain yield evaluation provides an indication of which hybrids would be good candidates for silage use. It is important to evaluate silage quality on these hybrids as well, but seed companies will often enter their hybrids into grain evaluation trials as a first step in determining what is worth marketing at all in the region. Thus grain yield evaluations of commercial hybrids provide essential comparative information to farmers interested in grain production in NNY and to seed companies who make marketing decisions based initially on performance in grain yield trials, and then may do subsequent silage evaluations. Since NNY farmers spend about \$6 million annually on corn seed for grain production, these evaluations are critical to the profitability and productivity of this important agricultural enterprise. Corn seed prices have climbed rapidly, making it more and more important to provide growers with information that allows them to choose hybrids that are well adapted and likely to be productive in the NNY region.

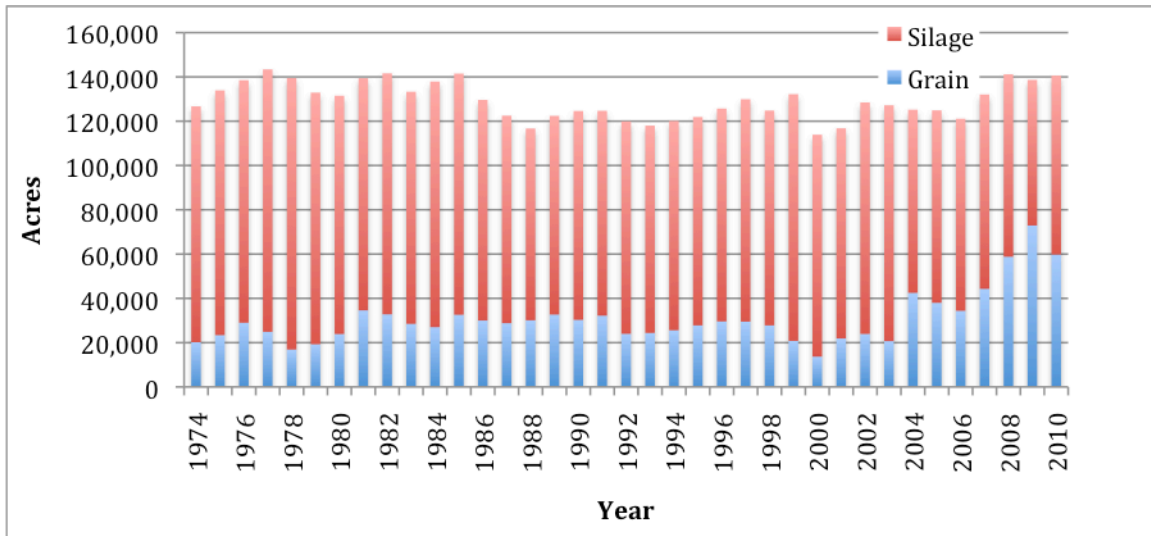


Figure 1. Acres harvested as corn grain (blue) and corn silage (red) in Northern New York from 1974 through 2010.

### **Methods:**

We evaluated early maturing hybrids (1400-1900 growing degree days, 70-90 days relative maturity) at one location in NNY (Chazy in Clinton county) to identify hybrids that can meet the needs of farmers in the region. Seed companies marketing corn in New York were contacted to request entry of their early maturing commercial hybrids into evaluation tests. Hybrids were compared for grain yield, maturity, stalk and root quality, and disease and insect resistance. Each hybrid was planted in three replications per location, with each replication consisting of a 1/500 acre plot (two rows, 17.5' long). Plots were thinned at the 6- to 7-leaf stage to a density of 28,000 to 30,000 plants/acre. Data was collected at thinning time (late June to early July) on plant counts. In September, plots were evaluated for early-season stalk lodging, root lodging, and animal damage. At harvest time (October or November), data were collected on final stalk and root lodging, grain weight, and grain moisture. These data were used to calculate grain yield per acre and yield:moisture ratio (a measure of hybrid efficiency in producing high yield under short-season conditions). Evaluation results were published in the 2011 Corn Report (annual data) and will be included in the 2013 Cornell Guide for Integrated Field Crop Management (multiple year results).

### **Results:**

The 2011 growing season in northern New York as a whole was favorable for corn. Wet conditions in May slowed down some planting operations, but generally favorable moisture and temperatures throughout the season in NNY provided a very good growing environment, particularly in contrast to many other parts of the state where very droughty conditions affected the crop at flowering time. Twenty-four eastern New York counties were declared disaster areas due to the effects of hurricane Irene in late August and/or tropical storm Lee in early September, including Clinton, Essex, and Lewis counties in

NNY. Several sites had severe root lodging due to these storms, including our location at Chazy. State average grain yield was 133 bu/A – down from the record 2010 yield of 150 bu/A but still the 4<sup>th</sup> highest average grain yield on record. At Chazy, the average yield for our hybrid test was 183 bu/acre, despite the storm-induced root lodging.

Results from the hybrid evaluation trial are shown in Table 1. The quality of our testing data this year was excellent, as reflected in the low coefficient of variation (CV) for yield (5.6%). This very low CV for yield indicates that the values in this table are reliable and not overly influenced by random variation in the testing field. Generally, a yield CV below 15% is considered evidence of high quality data.

Hybrid yields average 183 bu/acre and ranged as high as 206 bu/acre. Grain moisture at harvest was quite spread out, with some hybrids at about 23% and others as high as 30%. These differences could reflect significant variation in drying requirements for harvested grain – earlier maturing hybrids with drier grain at harvest time would require much less fuel expenditure to reduce moisture to acceptable levels for grain storage and marketing.

This type of variation is reflected in the yield:moisture ratio, which is an indicator of hybrid efficiency in producing high yield under short-season conditions. This ratio is one of the best guides to choosing a hybrid with excellent yield potential and appropriate maturity. The absolute value of the yield:moisture ratio at any given site is not important, but rather the relative values of the hybrids at that site. Thus hybrids like Hyland HLB 32R, Hyland 8166, and Growmark FS 3989VT3 looked especially good this in this environment (i.e., they had high yield:moisture ratios).

As a cautionary note, growers should choose hybrids based on multi-year and multi-location data whenever possible, since any hybrid can have a “banner environment” but not necessarily hold up as strongly over a range of different locations and growing seasons. This data will be incorporated into the results in the upcoming Cornell Guide for Integrated Field Crop Management, which provides that multi-year summary.

The results in Table 1 summarize information on a broad array of commercially available hybrids, allowing farmers and seedsmen to compare NNY-based data on productivity and adaptation of hybrids from various seed companies.

### **Conclusions/Outcomes/Impacts:**

Data in the hybrid production table in this report shows a number of hybrids that had excellent performance in NNY in 2011. However, hybrid choices should always be made based on the most comprehensive data available, usually multi-year and/or multi-location data. Such data is available in the Cornell Guide for Integrated Field Crop Management and this publication should be consulted, in combination with the individual test data presented here, when making hybrid choices.

### **Outreach:**

Results of 2010 testing were published in the 2010 Hybrid Corn Grain Performance Trials report (Plant Breeding Mimeo 2011-1, also available on the web at <http://plbrgen.cals.cornell.edu/cals/pbg/programs/departamental/corn/index.cfm>) and were incorporated into the tables of recommended hybrids in the 2012 Cornell Guide for Integrated Field Crop Management (Cornell University, 2011, also at <http://ipmguidelines.org/Fieldcrops/content/CH03/default-2.asp>). These results are available for farmer and seed company use in selecting hybrids best adapted to the challenging soils and climates of NNY. The publications are distributed through extension offices and at various extension and outreach meetings. Results from 2011 trials, which were harvested in late fall, are available in the 2011 Hybrid Corn Grain Performance Trials report (Plant Breeding Mimeo 2012-1, also at <http://plbrgen.cals.cornell.edu/cals/pbg/programs/departamental/corn/index.cfm>) and will be incorporated into the tables of recommended hybrids in the 2013 Cornell Guide for Integrated Field Crop Management (to be published by Cornell University in fall 2012).

### **Next steps if results suggest continued work is needed in the areas of research, demonstration and/or education:**

In future years when funding is available to support the additional costs of travel to the NNY region, we will plan to continue testing hybrids in NNY to ensure that farmers and seed companies have a solid basis for their choices of corn grain hybrids for this important region of the state.

### **Acknowledgments:**

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### **Reports and/or articles in which the results of this project have already been published:**

Smith, M.E. 2012. 2011 New York Hybrid Corn Grain Performance Trials. Cornell University, Cornell Cooperative Extension, Plant Breeding and Genetics 2012-1. 20 pp.

Smith, M.E. 2011. Hybrid selection for corn grain hybrids. pp. 51-53. In: Cox, W.J. and L. Smith (eds.) 2012 Cornell Guide for Integrated Field Crop Management. Pesticide Management Education Program, Cornell University, Ithaca NY. 158 pp.

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Table 1. 2011 Early maturity hybrid evaluation data from Chazy.

Brand	Hybrid	Grain Yield, bu/A	% Moisture	Yield: Mois. Ratio	% Stalk Lodge	Root Lodge Score*
Hyland	8166	171	22.7	7.5	4	0.0
Channel Bio	185-80VT3P	168	24.2	7.0	5	2.2
T A Seeds	TA 290-31	171	25.0	6.9	5	3.7
Hyland	HL B32R	195	25.2	7.8	1	2.7
Doebler's	329GRQ	180	25.7	7.0	7	3.3
Growmark FS	3989VT3	190	25.8	7.4	3	0.0
T A Seeds	TA 370-11	184	26.6	6.9	3	1.5
Growmark FS	3808VT3	192	27.6	7.0	2	0.0
Growmark FS	4217XRR	193	28.1	6.9	3	0.7
T A Seeds	TA 451-20	206	28.3	7.3	0	1.8
Hyland	8234	179	28.7	6.3	2	1.3
Doebler's	RPM ®269HRQ™	162	29.3	5.5	2	3.7
Growmark FS	4212VP3	187	30.5	6.1	2	1.0
	MEAN	183	26.7	6.9	3	1.7
	S.D.	10	1.6			
	C.V.	5.6	6.2			
	LSD(.05)	17	2.7			

\* Severe root lodging as a result of Hurricane Irene was rated in early September (0 = no lodging, 5 = completely lodged). This rating was done prior to Tropical Storm Lee, which would have added to root and stalk lodging totals.