

# Northern NY Agricultural Development Program 2006-2007 Project Report

## Corn Grain Hybrid Testing Program for Northern New York

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### Cooperating Producers:

- Jon Greenwood, St. Lawrence County
- Ron Robbins, Jefferson County

### Background

Corn is the primary row crop grown in northern New York (NNY), harvested from about 121,000 acres and providing essential feed for the dairy industry. Roughly 34,000 acres of this total were harvested as grain in 2006 – over one quarter of NNY’s total corn acreage. When ethanol production facilities in NY are completed, the increased demand for corn grain as ethanol feedstock will provide new grain marketing opportunities for NNY farmers and increase interest in corn production for grain in this region. The grain produced by corn hybrids 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 may or may not do subsequent silage evaluations.

### Methods:

During 2007, we summarized the results of early and medium-early maturity corn grain testing done in 2006 and tested a new set of hybrids in each of these maturity groups at NNY locations. Seed companies marketing corn in New York were contacted to request entry of commercial and near-commercial hybrids into these evaluation tests. We evaluated 14 early maturing hybrids (1400-1900 growing degree days, 70-90 days relative maturity) at two locations in NNY: one at the Miner Institute’s research farm in Chazy, Clinton County, and one at Jon Greenwood’s farm in Madrid, St. Lawrence County. In addition, we evaluated 29 medium-early maturing hybrids (1900-2400 growing degree days, 85-100 days relative maturity) at Ron Robbins’s farm in Sackets Harbor, Jefferson County. These evaluations were designed to identify hybrids that can meet the grain and silage needs of farmers in the region.

Each hybrid was planted in three replications per location, with each replication consisting of a two-row plot, 17.5' long and thinned 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 and unusually good or poor plant vigor. In September, plots were evaluated for reaction to any disease or insect pests that occur at each site, for unusually tall or short plants (indicative of potential value as a silage hybrid), and for early-season stalk lodging, root lodging, and animal damage. At harvest time (November), data was collected on final stalk and root lodging, animal damage, grain weight, grain moisture, and test weight. 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). Results of 2006 testing were published in the 2006 Hybrid Corn Grain Performance Trial Report (Plant Breeding Mimeo 2007-1) and were incorporated into the tables of recommended hybrids in the 2008 Cornell Guide for Integrated Field Crop Management (Cornell University, 2007). These results are available for farmer and seed company use in selecting hybrids best adapted to the challenging soils and climates of NNY. Results from 2007 trials, which were harvested during October and November, will soon be available in the 2007 Hybrid Corn Grain Performance Trials Report (Plant Breeding Mimeo 2008-1) and will be incorporated into the tables of recommended hybrids in the 2009 Cornell Guide for Integrated Field Crop Management (to be published by Cornell University in fall 2008).

### **Results:**

In 2007, we started off with generally dry weather in May that helped with getting the corn crop in the ground in a timely manner. June was fairly warm (due to a hot spell at the end of the month) but had adequate rainfall in some locations (Chazy and Madrid) but not at Sackets Harbor, where a droughty spell began in June and lasted for much of the growing season. Cooler wetter weather prevailed in July, just before and during flowering. Dry conditions returned throughout most of the state in August, with exceptionally dry conditions at Sackets Harbor during August and into September. October tended to be warmer than normal, helping the crop to mature. Although the 2007 growing season in the state as a whole was warmer and drier than long-term averages, the cooler wetter July weather resulted in a high state average yield of 127 bu/acre – just 2 bu/A below last year's record. At our NNY locations, average yields for our hybrid tests were very good and ranged from 169 bu/acre to 190 bu/acre.

Results from all three hybrid evaluation trials are shown in Tables 1, 2, and 3 below. The quality of our testing data this year was excellent, as reflected in the low coefficients of variation (CVs) for yield in the trials (9% at Chazy, 13% at Madrid, and 11% at Sackets Harbor). These low CVs indicate that the values in these tables are quite reliable and not overly influenced by random variation in the testing fields. These results include information on a broad array of commercially available hybrids, allowing farmers and seedsmen to compare productivity and adaptation of hybrids from various seed companies.

**Table 1. 2007 Early Maturity Hybrids, Chazy, Clinton County.**

<b>Brand</b>	<b>Hybrid</b>	<b>Yield, bu/A</b>	<b>% Mois- ture</b>	<b>Yield: Moisture Ratio</b>	<b>% Stalk Lodging</b>
Hytest	HT17-07	165	21.8	7.6	0
Hyland	HLR228	171	23.1	7.4	2
Growmark FS	3967XRR	172	23.3	7.4	10
Hyland	HLB264	144	23.8	6.1	10
NK	N20-R7	184	24.0	7.7	5
Hyland	HLB256	153	24.5	6.2	0
Growmark FS	3676XRR	161	24.6	6.5	1
TA Seeds	TA290-11	193	25.7	7.5	17
Dekalb	DKC41-57(VT3)	175	25.8	6.8	6
TA Seeds	TA303-13	139	25.8	5.4	13
Hyland	HLB33R	166	26.1	6.4	9
Doebler's	286XRR	172	26.9	6.4	1
Hyland	HLB266	181	27.0	6.7	6
Hytest	HT7220	185	28.9	6.4	6
	Mean	169	25.1	6.7	6
	CV	9	2.8		
	LSD	24	1.2		
	SD	15	0.7		

**Table 2. 2007 Early Maturity Hybrids, Madrid, St. Lawrence County.**

Brand	Hybrid	Yield, bu/A	% Mois- ture	Yield: Mois- ture Ratio	Stand- Ability, 1-9 scale*	% Stalk Lodg- ing	Test Weight, Lb/bu	Stay Green	Early Vigor	Rust
Hyland	HLR228	183	20.8	8.8	8.3	0	55	3.7	2.7	3.8
Hyttest	HT17-07	165	20.9	7.9	8.3	0	57	3.7	2.3	3.5
Hyland	HLB264	196	21.0	9.3	8.7	1	54	3.5	3.0	2.5
TA Seeds	TA290-11	211	21.0	10.0	8.3	0	54	3.7	4.0	1.5
Hyland	HLB256	146	21.2	6.9	7.7	2	57	4.7	3.5	1.7
NK	N20-R7	205	21.3	9.6	8.3	0	56	3.3	2.2	2.5
Hyland	HLB266	209	21.4	9.8	8.0	0	53	3.5	3.7	0.7
Dekalb	DKC41- 57(VT3)	214	21.4	10.0	8.3	1	54	3.8	3.3	2.3
Growmark FS	3676XRR	196	21.4	9.2	8.3	1	57	3.5	3.7	1.7
Growmark FS	3967XRR	173	21.8	7.9	8.7	0	56	3.5	3.7	2.7
Hyland	HLB33R	189	21.9	8.6	8.3	0	54	3.2	3.3	0.8
TA Seeds	TA303-13	155	22.6	6.9	8.3	0	55	3.0	3.3	1.7
Hyttest	HT7220	238	22.8	10.4	8.7	0	55	3.3	2.3	3.5
Doebler's	286XRR	177	23.0	7.7	8.7	0	54	2.8	2.5	2.7
	Mean	190	21.6	8.8	8.4	0.4	55	3.5	3.1	2.3
	CV	13	2.2		7.0		3			
	LSD	42	0.8		1.0		3			
	SD	25	0.5		0.6		2			

\* Standability is rated on a 1-9 scale with 9=strong resistance to breakage when pushed and 1=very weak and easily broken stalks; 1-5 rating scales for stay-green and rust have 1=completely green plants or no rust on leaves and 5=completely dead plants or many rust lesions on many leaves; for early vigor, a rating of 5=big vigorous plants and 1=small weak plants.

**Table 3. 2007 Medium-early Maturity Hybrids, Sackets Harbor, Jefferson County.**

Brand	Hybrid	Yield, bu/A	% Mois- ture	Yield: Mois- ture Ratio	Stand- Ability, 1-9 scale*	% Stalk Lodg- ing	Test Weight, lb/bu	Stay Green	Early Vigor 1-5 scale*	Plant Height
TA Seeds	TA461-13	173	17.4	9.9	8.7	4	56	3.5	2.8	2.8
Dyna-Gro	54P55	169	17.5	9.7	8.3	4	57	3.8	2.3	2.7
Hyland	HLCBR54	159	17.6	9.0	8.0	13	56	3.7	3.2	3.0
Hyland	HLB286	164	17.6	9.3	7.3	10	57	3.7	3.0	3.5
NK	N29-A2	174	17.7	9.8	8.0	9	57	4.3	2.7	1.7
Hyttest	HT7398	168	17.8	9.4	8.3	10	56	3.8	2.7	3.3
TA Seeds	TA451-11	193	17.8	10.8	8.3	8	57	4.2	2.7	2.8
Growmark FS	4861XRR	185	17.9	10.3	8.3	1	57	4.0	2.7	1.8
Hyland	HLB282	148	18.0	8.2	7.3	16	58	3.8	3.0	2.3
Doebler's	377BWR	136	18.1	7.5	8.0	8	58	3.3	3.0	2.0
Growmark FS	4464XRR	140	18.2	7.7	8.7	6	60	3.3	3.0	2.3
Hyttest	HTEXP3824	165	18.1	9.1	8.3	6	58	4.0	3.7	3.0
Dyna-Gro	54T42	158	18.2	8.7	7.7	27	57	3.8	2.7	3.7
Hyland	HLB38R	205	18.2	11.3	9.0	4	57	3.5	2.5	2.7
Doebler's	468RB	174	18.2	9.6	8.3	3	58	3.2	2.5	3.8
TA Seeds	TA500-00	171	18.2	9.4	8.3	5	56	3.2	3.7	3.8
Dekalb	DKC45- 82(RR2)	177	18.3	9.7	8.0	5	57	3.7	3.2	2.0
Growmark FS	4819XRR	199	18.3	10.9	9.0	4	57	3.5	2.3	3.3
Hyttest	HT7428	179	18.3	9.8	8.0	2	57	3.7	2.3	2.7
Dekalb	DKC49- 35(RR2)	207	18.4	11.3	8.7	1	57	4.0	2.2	3.3
Golden Harvest	H6455CB	179	18.4	9.7	8.0	9	57	4.0	3.5	1.8
Golden Harvest	H7436CB	150	18.5	8.1	7.7	7	57	3.8	3.3	2.5
Dyna-Gro	55V18	160	18.6	8.6	8.3	6	58	3.3	3.0	2.7
NK	N39-Q1	178	18.7	9.5	8.3	13	59	3.7	3.0	3.8
Golden Harvest	H7540	200	18.7	10.7	7.3	11	56	3.5	2.8	2.8
Dekalb	DKC46- 60(VT3)	170	19.2	8.9	8.3	3	57	3.0	2.3	2.5
	Mean	172	18.2	9.5	8.2	8	57	3.7	2.9	2.8
	CV	11	2.7		7.3		2.7			
	LSD	31	0.8		1.0		2.5			
	SD	19	0.5		0.6		1.5			

\* Standability is rated on a 1-9 scale with 9=strong resistance to breakage when pushed and 1=very weak and easily broken stalks; 1-5 rating scale for stay-green has 1=completely green plants and 5=completely dead plants; for early vigor and plant height, a rating of 5=big vigorous or tall plants and 1=small weak or short plants.

**Conclusions/Outcomes/Impacts:** (Recommendations, guidelines, application[s] to NNY agriculture etc, including **negative results**. Production guidelines/suggested management practices etc. that flow from the research. If farmers are involved in the research or demonstration, provide information on their impressions on the importance of the work its usefulness at the farm level and benefits they are seeing.)

Data in the hybrid production tables in this report shows a number of hybrids that had excellent performance in NNY in 2007. However, hybrid choices should always be made based on the most comprehensive data available, usually multi-year and/or multi-location data. Multi-year 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 2006 testing were published in the 2006 Hybrid Corn Grain Performance Trial Report (Plant Breeding Mimeo 2007-1) and were incorporated into the tables of recommended hybrids in the 2008 Cornell Guide for Integrated Field Crop Management (Cornell University, 2007). 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 2007 trials, which were harvested during October and November, will soon be available in the 2007 Hybrid Corn Grain Performance Trials Report (Plant Breeding Mimeo 2008-1) and will be incorporated into the tables of recommended hybrids in the 2009 Cornell Guide for Integrated Field Crop Management (to be published by Cornell University in fall 2008).

### **Next steps:**

In future years, we will plan to continue testing hybrids in the NNY region 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. In addition, we aim to evaluate starch content of different hybrids grown in these trials to assess the potential ethanol yield from each hybrid.

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

Smith, M.E. 2007. 2006 New York Hybrid Corn Grain Performance Trials. Cornell University, Cornell Cooperative Extension, Plant Breeding and Genetics 2007-1. 18 pp.

Cox, W. (ed). 2007. 2008 Cornell Guide for Integrated Field Crop Management. Cornell University Cooperative Extension. 145 pp.

Smith, M., R. Ericson, S. Norman, and K. Payne. 2007. Corn Grain Testing and Corn Breeding at Cornell University. A handout distributed at the 1<sup>ST</sup> Annual Summer Crop Tour, sponsored by New York Corn Growers Association and Cornell Field Crop and Soil Program Work Team, 20 August 2007, Sackets Harbor NY.

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