

# What's Cropping Up?

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Corn silage hybrids, typically grown in central/western NY, range in relative maturity (RM) from about 95 to 115 days. Topographical differences and proximity to the Finger Lakes and Great Lakes greatly influence growing degree days and

first fall frost, which subsequently influence the hybrid RM that dairy producers should select for their farm. Many dairy producers will select their corn silage hybrids for the 2009 growing season by early November of 2008 so they can receive the early purchase discount from their seed companies. This article will discuss the relative yield, the differences in harvest moisture, and the number of growing degree days (GDD) from planting to corn silage harvest for hybrids from 95 to 115 day RM. The data from the Cornell Corn Silage Hybrid Trials, in which 10-20 hybrids are entered in each RM group, will be the source of data for this discussion.

As the RM of each hybrid increases by 5 days in length, silage yields, adjusted to 65% moisture, increase by about 0.5 tons/acre (Table 1). Consequently, a 115 day hybrid would be expected to yield about 2 tons/acre more than a 95 day hybrid. Despite the remarkable consistency in the average 0.5 ton/acre yield increase across the western and central NY experimental sites, the year to year variability among RM groups is much more pronounced (Table 1). For example, dry conditions occurred during the second half of August in 2008.

## How Does Hybrid Relative Maturity Affect Corn Silage Yields and Moisture Levels in Central/Western New York?

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Consequently, the 111-115 day hybrids, which were 3-5 days behind in development compared to the 106-110 day hybrids, probably suffered more stress during late grain-filling and didn't quite realize their full yield potential at either site this year.

In other years, when dry conditions occur in July and August but are relieved during late August and early September, as in central NY in 2004, the longer season hybrids will yield higher than expected when compared to the earlier hybrids. This is because stress was relieved during their late grain-filling period in the later but not in the earlier hybrids (Table 1).

Despite the higher yield potential of longer-season hybrids, dairy producers should not plant all their hybrids to the longest possible hybrids because in years with an earlier than normal frost the later-planted hybrids would probably be frosted before attaining 70% moisture, thus reducing their yield potential. Also, in cool years, the long-season hybrids will not

attain 70% moisture until late September or early October when soil moisture conditions become wetter and drying conditions slow down considerably, which impede harvest. In general, as the RM of a hybrid increases by 5 days in length, whole plant moisture will be about 1.5 percentage points wetter on a particular date (Table 2). If it is a warm growing season and silage harvest commences in early September, there will only be about a 3-day delay for a 110

Table 1. Average corn silage yields of the 95-100, 101-105, 106-110, and 111-115 hybrids in the different relative maturity groups entered in the Cornell Corn Silage Hybrid Trials at Southview Farms in Livingston Co in 2004, 2005, 2006, 2007, and 2008.

Hybrid Maturity Group	2004	2005	2006	2007	2008	Avg.
Tons/acre (65 % moisture)						
<u>Central NY</u>						
95 -100	23.9	20.9	27.6	22.6	25.0	24.0
101-105	24.1	20.7	28.4	22.7	26.5	24.6
106-110	26.2	22.3	29.4	22.5	27.2	25.5
111-115	26.4	23.3	29.1	23.6	26.9	25.9
<u>Western NY*</u>						
95 -100	23.1	24.7	28.3	26.9	29.0	26.3
101-105	23.6	24.6	28.7	27.5	30.1	26.8
106-110	25.4	22.9	29.2	28.4	30.6	27.3
111-115	26.1	23.5	30.8	28.9	30.4	27.8

\* The Western NY site was harvested on the early side in 2005 to avoid wind damage from remnants of Hurricane Katrina.

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Table 2. Average whole plant moisture of hybrids in the 95-100, 101-105, 106-110, and 111-115 relative maturity groups at Southview Farms in Livingston Co. on the same day of harvest in 2004, 2005, 2006, 2007, and 2008. About 10-20 hybrids represented each maturity group in each year of the study.

Hybrid Maturity Group	2004	2005*	2006	2007	2008*	Avg.
days						
		% moisture				
95-99	65.7	69.1	65.8	66.4	66.0	66.6
101-105	66.9	70.7	67.4	68.1	67.4	68.1
106-110	68.2	72.2	69.2	68.9	69.0	69.5
111-115	69.5	73.3	70.2	70.2	70.0	70.6

\* The Western NY site was harvested on the early side in 2005, to avoid wind damage from remnants of Hurricane Katrina.

day hybrid to attain comparable moisture as a 105 day hybrid because silage dries at about 0.5 percentage points per day under the warm conditions. In late September and early October, however, conditions are cooler and cloudier and the days are shorter so silage in the field is now drying at 0.25 to 0.33 percentage points per day. Consequently, a 110 compared with a 105 day hybrid will now be at the same moisture about a week later.

In general, 95-100 day hybrids require 2000-2100 GDD, 101-105 day hybrids require 2050-2150 GDD, 106-110 day hybrids require 2100-2200 GDD, and 111-115 day hybrids require 2150-2250 GDD from planting to less than 70% moisture, almost ready for corn silage harvest and safe storage in bunker silos (Table 3). Dairy producers should use the accumulated GDD from early May to late September on their farm as a guide in selecting hybrid RM. For example, the average number of GDD at Geneva NY, from May 1, a typical date to begin planting corn in that area, to October 5, a typical date for the first fall frost in that area, is about 2300 GDD. Despite the relatively long growing season for this area, growers in the Geneva area should not choose all 111-115 day hybrids. Instead, growers should spread their hybrid maturity groups out to avoid the

risk of drought when all hybrids are silking, to avoid the risk of an early frost on the later-planted hybrids, and to avoid the risk that all hybrids would be ready for harvest at about the same date. For example, dairy producers in the Geneva region may wish to plant 30% of their acreage to 111-115 day hybrids, 50% of their acreage to 106-110 day hybrids and 20% of their acreage to 101-105 day hybrids. Dairy producers in cooler regions, such as around the Ithaca area where about 2200 GDD accumulate from May 1 until October 1, the first average fall frost, should scale back in hybrid length and go with maybe 30% of their acreage to 106-110 day hybrids, 50% of their acreage to 101-105 day hybrids, and 20% of their acreage to 95-100 day hybrids. Because of the randomness of the growing season, a mixture of hybrid maturities will not be best for each growing season. Over time, however, spreading out the hybrid maturity length is the safest and best management practice.

Table 3. Tasseling/silking and silage harvest dates (67-70% moisture), and number of growing degree days (GDD) from planting to silking, between silking and harvest, and total number from planting to harvest for 95-100, 101-105, 106-110, and 111-115 day hybrids planted in late April of 2003, 2004, and 2005 at the Aurora Research Farm.

Hybrid Maturity Group	Tassel/Silk	GDD	Silage Harvest	GDD from Silking	Total GDD
Relative Maturity		°F	Date	°F	°F
<u>2003</u>					
95-100	7/24	~1250	8/28	~775	~2025
101-105	7/27	~1300	9/5	~850	~2150
106-110	7/29	~1340	9/9	~850	~2190
111-115	7/31	~1380	9/11	~850	~2230
<u>2004</u>					
95-100	7/20	~1250	8/31	~725	~1975
101-105	7/22	~1300	9/3	~750	~2050
106-110	7/23	~1330	9/5	~775	~2105
111-115	7/24	~1350	9/7	~800	~2150
<u>2005</u>					
95-100	7/17	~1285	8/21	795	2080
101-105	7/19	~1330	8/22	815	2115
106-110	7/21	~1370	8/25	810	2180
111-115	7/22	~1405	8/26	810	2215