Using the Number of Growing Degree Days from the Tassel/Silking Date to Predict Corn Silage Harvest Date

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Temperature or accumulated growing degree days (GDD) strongly influences the growth and development of corn. Corn requires about 110-120 GDD to emerge under typical conditions, although deep planting or heavy residue increases the number of GDD for emergence. Likewise, 101-105 day hybrids require about 1300 GDD from emergence to silking, although hot and dry conditions in July will delay silking and thus increase the number of GDD, as it did in 2005 (Table 1). A challenge each year is to determine when to begin corn silage harvest. We estimated the number of GDD from the tassel/silking date to the silage harvest date, typically at 68-69% moisture in our corn silage hybrid trials, at the Aurora Research Farm in 2003, 2004, and 2005 to determine if the accumulated GDD between the two dates can predict when to begin corn silage harvest.

The number of calendar days between the tassel/silking date and the silage harvest date varied significantly across years (Table 1). In 2004, when drought did not occur, all hybrids, regardless

Table 1. Tasseling/silking dates, silage harvest dates, and number of calendar and growing degree days (GDD) between the two dates for 96-100, 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	Days	GDD
Relative Maturity		°F	Date		°F
			2003		
96-100	7/24	~1250	8/28	35	~775
101-105	7/27	~1300	9/5	40	~850
106-110	7/29	~1340	9/9	42	~850
111-115	7/31	~1380	9/11	43	~850
			2004		
96-100	7/20	~1250	8/31	42	~725
101-105	7/22	~1300	9/3	43	~750
106-110	7/23	~1330	9/5	44	~775
111-115	7/24	~1350	9/7	45	~800
			2005		
96-100	7/17	~1285	8/18	31	~780
101-105	7/19	~1330	8/22	34	~815
106-110	7/21	~1370	8/25	35	~810
111-115	7/22	~1405	8/26	35	~810

of maturity group, were harvested 42 to 45 days after the tassel/silking date, very close to the typical 45 day interval often cited on when to begin corn silage harvest. In 2005, a year with significant drought, all hybrids were harvested only 31 to 35 days after the tassel/silking date. Obviously, the use of calendar days after the silking date is not a good predictor on when to begin corn silage harvest in droughty years.

The number of GDD from the tassel/silking date to the silage harvest date varied modestly between years for each hybrid group (Table 1). In 2003 and 2005, the 96-100 day hybrids required about 775 GDD from the tassel/silking date to the silage harvest date compared with only 725 GDD in 2004. The 101-105, 106-110, and 111-115 day hybrids required about 850 GDD from the tassel/silking date until the silage harvest date in 2003 but only 750 to about 800 GDD in 2004 and 2005. August of 2003 was dry (1.65 inches of precipitation) and hot (678 GDD) so the corn was somewhat drought-stressed in late August (Table 2). About 2 inches of precipitation occurred on August 31-September 1, which resulted in significant rehydration of corn, so the harvest of the 101-105, 106-110, and 111-115 day hybrids were delayed a few days until moistures got back down to below 70%. Consequently, there were 50 more GDD between the tassel/silking date and the corn silage harvest date in 2003. August of 2004 was cool (563 GDD) and wet (5.55 inches of precipitation) so the corn was not drought-stressed. The 3 inches of precipitation that occurred on August 28th did not result in rehydration as indicated by whole plant moistures of 68% for the 96-100 day hybrids on August 31st. Apparently, antecedent soil moisture and corn conditions (i.e. drought-stressed) influence the degree of rehydration of corn, which influences the silage harvest date. Overall, however, the 96-100 day hybrids required about 750 and the 101-105, 106-110, and 111-115 day hybrids required about 800 GDD from the tassel/silking date until the beginning of corn silage harvest.

Table 2. Monthly growing degree days (GDD, 86-50^{o}F system) and precipitation at the Aurora Research Farm during the 2003, 2004, and 2005 growing seasons.

	2003		2004		2005	
Month	GDD	Precip.	GDD	Precip.	GDD	Precip.
May	251	4.34	408	6.82	233	1.00
June	458	3.14	449	1.75	654	4.33
July	642	5.68	609	5.47	734	2.05
August*	678	1.65	563	5.55	716	2.24*
	2029	14.81	2029	19.59		

*From August 1st through August 26^{th,} the date of harvest of the 111-115 day hybrids.

Predicting corn silage harvest, based on GDD from the tassel/silking date to the silage harvest date, is not perfect because other environmental factors can also influence when corn silage harvest begins. Nevertheless, the use of accumulated GDD from the tassel/silking date can be used as a guide on when to begin corn silage harvest. We will be ready to begin harvest of our 96-100 day hybrids at about 750 GDD after the silking date and our 101-105, 106-110, and 111-115 day hybrids at about 800 GDD after the silking date. In some years, we may be right at 68% moisture and can begin that day. In other years, we may have to wait a couple of days, especially if rehydration of the corn hybrids occurred because of significant precipitation after an extended dry period. If you wish to use accumulated GDD after the tassel/ silking date as a guide on when to begin corn silage harvest, we urge you not to use the GDD data from big-city weather stations such as Buffalo, Rochester, Syracuse, Utica, Albany, etc, Instead, use weather stations from more rural locations such as Dansville, Batavia, Geneva, Aurora, Canton, Chazy, etc, because the number of GDD from those weather stations would more accurately mimic the actual GDD accumulated in nearby corn fields.