

Late planted corn for silage and GDD accumulation

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The June 10, 2019 NYS Crop Progress Report from USDA shows corn planting at 50 percent compared to a five-year average of 82 percent. As we enter June with a great deal of corn yet to be planted we thought we would take a look the average number of growing degree days (GDD's) remaining in the season.

This is highly speculative as we don't know what the season will hold, particularly with more erratic weather patterns over the last decade. However, it may still be worth looking at the average growing season to get a sense of what we might see for the remainder of the year. Using the CLIMOD program to determine average date of first killing frost we looked at GDD accumulation for June planting dates (Figure 1a and 1b and Table 2). In an effort to address differing growing climates around the state, six locations were selected. We used 28°F as a killing frost. While an extended period of 29-31°F can also kill the plant, at 28°F the plant will shut down in a short period of time. Oftentimes when we get a light frost (around 30°F) it may kill the leaves and make the plant look dead but the stalk is still alive. In these situations, it can actually slow further dry-down as the dead leaves inhibit normal plant functions as it continues to mature.

An [interactive GDD calculator](#) from the Climate Smart Farming Program allows you to pinpoint your exact location and determine the likelihood of reaching a target number of growing degree days based on planting date and average first frost date. Dr. Kitty O'Neil with the North Country Regional Ag Team developed a [short video](#) to help explain how to use this online tool.

To utilize this data we need to understand the number of GDD's needed from planting to silage harvest. Work performed by Bill Cox in the early 2000's (Musgrave Research Farm in Aurora, NY) showed that "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 percent moisture, almost ready for corn silage harvest" (Table 1). Note the last comment, ALMOST ready for corn silage harvest. We would like to see that moisture drop another five points to get into the 65 percent range.

To find data on hybrids below 95-day relative maturity (RM) data from various companies, who report the number of GDD's needed to get to black layer, was extrapolated. For silage, a rule of thumb is to subtract 150 GDD's off of the number of GDD's needed for black layer. These are summarized in Table 1.

This data is utilized in Table 2 to determine the approximate number of GDD's from a June 1 or June 10 planting date to the average date of the first killing frost.

Keep in mind that this is static information for the dates chosen and based on historical averages. The Growing Degree Day Calculator from Climate Smart Farming that is referenced above can provide a more dynamic prediction for your specific location but should still be used with caution given the unknown for the remainder of the growing season.

TABLE 1. Approximate GDD from planting to near silage maturity

Hybrid RM	Musgrave Farm Study (Cox and Atkins)	Industry Averages Silage (black layer – 150)
~ 80	-	1850 - 1900
~ 85	-	1900 - 1975
~ 90	-	1975 - 2050
95-100	2000 - 2100	-
101-105	2050 - 2150	-
106-110	2100 - 2200	-
111-115	2150 - 2250	-

At a point where even a short season hybrid is a risky choice for a given location a producer looking at emergency forage options may consider switching back to a long season corn with the intent of accumulating as much forage yield as possible (at such a late date) while recognizing this crop is unlikely to develop an ear.

Table 2. GDD accumulation to average first frost for each location

Location	Average Date of 1 st Killing Frost (28°F)	GDD (86/50) June 1 to Killing Frost	GDD (86/50) June 10 to Killing Frost
Peru	Oct. 9	2180	2040
Albany	Nov. 2	2500	2370
Lowville	Oct. 5	1890	1820
Aurora	Oct. 30	2350	2210
Avon	Oct. 21	2325	2175
Jamestown	Oct. 19	2130	1990

For more considerations on emergency forages refer to the accompany article: [PD-2019-06-02. Late spring: Forage considerations beyond corn.](#)

References:

Climate Smart Farming, A program of Cornell University. Growing Degree Day Calculator.

Cox, W., P. Atkins. How Does Hybrid Relative Maturity Affect Corn Silage Yields and Moisture Levels in Central/Western New York?. What's Cropping Up? Vol. 18 No. 5



FIGURE 1a. Average GDD accumulation from June 1st and average date of first frost

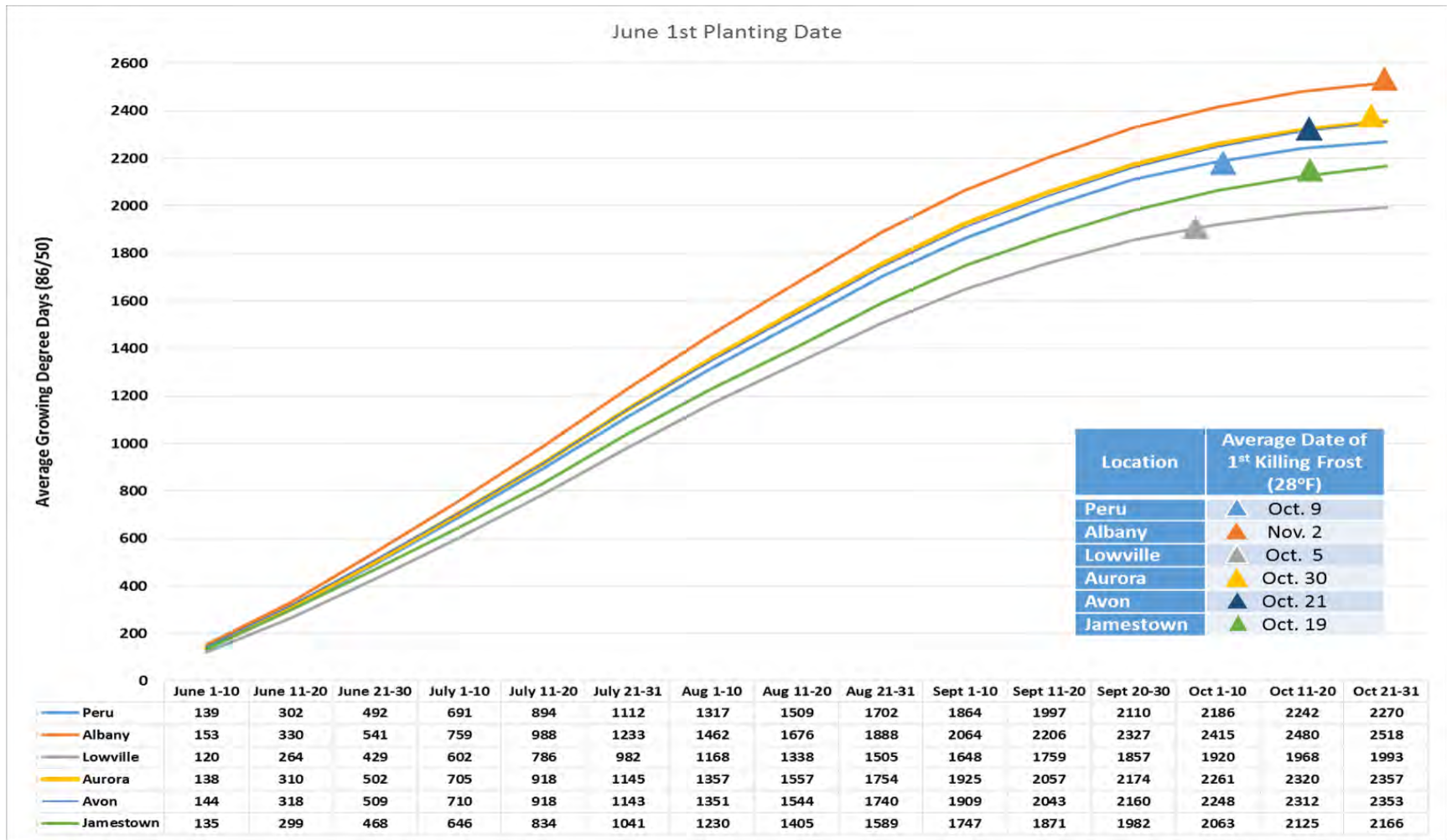


FIGURE 1b. Average GDD accumulation from June 10th and average date of first frost

