

**To Pre or not to Pre**  
**March 26, 2020**

Spring 2020, unlike 2019 and 2018, is seeing a steep increase in ambient temperatures with a concurrent increase in soil temperatures. One management practice that we have discussed previously and is closely linked with soil temperature is the application of preemergence herbicides. Summer annual grasses, such as crabgrass, require optimal soil temperature and moisture to germinate and persist. Crabgrass and foxtail germination will occur when soil temperatures in a lawn at the 0-2 inch depth are consistently between 60 and 70 F. For preemergence herbicides to be most effective, they must be applied before the soils reach this optimum temperature range. A soil temperature of 55 F (daily average) for several consecutive days is a normally reasonable based estimate for preemergence application timing.

The Growing Degree Day, or GDD, is a heat index that can be used to predict when a crop (turf) will reach maturity. A simple way to track GDD's across multiple base temperatures and locations is the Michigan State turf specific website ([www.GDDTracker.net](http://www.GDDTracker.net)) to time the first application. The website has a disclaimer "*The GDD models have only been "ground-truthed" in the Great Lakes region. Use of models outside of this region, including the North East, Great Plains and Transition Zones, should be used with caution. We do not recommend the GDD models we use for the mid/southern transition zone and southern states.*" We have been comparing our soil temperatures and predicative value for preemergence applications with the program over the last several years and find the program using real-time Nebraska data with reasonably accurate ambient temperature predictions. The crabgrass specific model on the site has predicted optimal preemergence application windows that are slightly earlier than we estimate, usually by 7-10 days. Currently (Figure 1) the model indicates we are in the optimal timing window across most of Nebraska. Soil temperature data from Nebraska weather stations indicate soil temperatures at the 4 inch depth (<https://cropwatch.unl.edu/soiltemperature>) in the low to mid-40 F range. This indicates that we are not at the optimal soil temperature and getting close. We are estimating a week to 10 day earlier application start time for 2020 (April 1-10) depending on location. A comprehensive resource for soil temperature data and collection can also be found at: <https://cropwatch.unl.edu/2019/soil-temperature-resources>.

Site specific soil temperatures can be measured with a temperature probe. Probes appropriate for this use can be found at local retailers and on-line. Using an indelible marker, place a line 2 inches from the tip of the probe. While most on-line resources measure soil temperature at 4 inches data support the use of a 2 inch depth as a better indicator because the majority of the seeds are at or near the surface. Take multiple measurements throughout the yard as location does influence temperature. Table 1 shows measurement taken across the same lawn in Lincoln on March 26, compared with <https://cropwatch.unl.edu/soiltemperature> near the home site. A soil temperature of 55 F (daily average) for several consecutive days is a normally reasonable based estimate for preemergence application timing.

**NOTE:** [www.GDDTracker.net](http://www.GDDTracker.net) has a wealth of turf specific information that you might find of value at your facility. There is no cost to use the site.

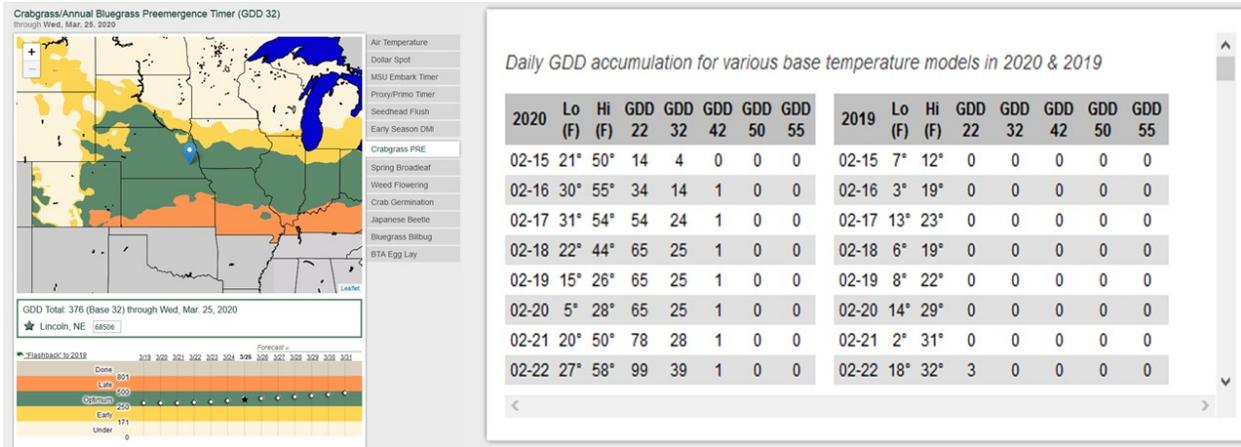


Figure 1. Michigan State University GDD tracker ([www.GDDTracker.net](http://www.GDDTracker.net)) screen captures on March 26, 2020. Graphic on left indicates predicted optimal application window for preemergence herbicide applications for Nebraska region. Graphic on right demonstrates the considerable difference between temperature and heat accumulation in 2020 vs. 2019.

Table 1. Soil temperature data using a hand-held digital probe at different locations in a lawn in Lincoln, NE. March 26, 2020

Probe depth	Bare ground, full sun	Full sun, turf	Tree shaded, turf	Hillside southern exposure, turf	Crop Watch Site
2 inch	56 F	48 F	44 F	52 F	-----
4 inch	54 F	44 F	41 F	50 F	48 F

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