

Customizable Growing Degree Day Application

Browser requirements:

This web application should work across all browsers and versions. To date, testing has been performed on both Windows and MacOS, with various browsers such as Chrome, Firefox, Internet Explorer, Edge, and Safari. It has also been tested on various hand-held devices, including Android smartphones, Apple smartphones, and Apple iPads.

Install instructions:

While you do not need to install anything, if you select the “Auto-detect” option and click the “Visualize” button, you may see a pop-up indicating that your browser wants to access your current location. You can say no if you would rather not disclose your location, which means you will manually have to enter an address to find the nearest weather station.

Using the Application:

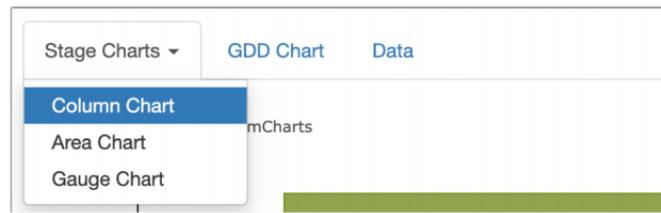
1. Once you load the website, you will be asked to select the following to customize your GDD chart:
 - a. What type of crop? Select Corn or Soybeans.
 - b. Where is your field located? Select “Auto-detect” if you allow your browser to know your location (note, this functionality does not currently work on all mobile devices so location may have to be entered in manually). Or, if you do not have your location turned on or would rather enter a remote location, select the “Enter Address” option. You can then type in a specific address to look up. This works at various levels, from a specific street address to a more generic city/state or zip code.
 - c. When was the crop planted? Select the planting date.
 - d. Historical end dates can be entered to look up past growing season information. Note that some weather stations don’t provide their data on a daily basis, so if you specify a certain end date and the information is not available, the application will automatically adjust to include the most recent information. This is noted when the graphs are displayed with an asterisk and will show which date was actually used. Example, on August 9th the following displayed:

With a corn planting date of **May 6th** and a current date of **August 7th***, the application displays the **B blister kernels** growth stage and **884** growing degree days until **September 21st**, which is **45** days away from August 7th.

* Using August 7th as current date, since this is the latest weather data available

2. Click the “Visualize” button to display the chart with a summary of information based on the GDD calculation.

3. To view other visualization types, click the down arrow next to the Stage Charts tab and select a different option:



4. The GDD Chart tab shows a chart illustrating the estimated maturity date. The chart options at the top are clickable in order to only show information of interest at any given time. Like the Stage Charts, hovering over the visualization with either the mouse or pressing with your finger on a mobile device will show information about that particular point. You can also zoom in on this chart to see various time increments in greater detail.
5. The Data tab displays the raw data that was used to create the visualizations. Location and weather station information is also included here.

Technical Information:

Weather information is being pulled from NOAA using their web service APIs (application programming interface). The Geocodio web service API is also being used to translate the user's latitude and longitude or inputted address into a geographic area that can be passed to the NOAA web service to determine nearby weather stations.

Upon entering an address, the application will determine your latitude and longitude (unless you are using auto-detect, in which case your browser already has this information). This information is used to look up the nearest weather station. Once the nearest weather station has been located, the planting date and current date are used to find historical temperature information. Using this temperature data, the growing degree days can be accumulated.

This application was developed using PHP and JavaScript. Charts are generated using the amCharts library that is publicly available.

Things to Note:

NOAA has gaps in historical weather data (either temperature or the dates). To remedy this, data is pulled in from up to the five nearest weather stations, expanding the radius until the gap(s) can be filled. However, if the missing data is not found an error will display to the user ("Unable to fetch temperature data from weather stations"). If no weather stations can be found within the specified time frame for the specified location,

then an error will be displayed to the user (“No weather stations found within time frame”).