

The Usefulness Behind “Growing Degree Days”



As you transition from the cold winter months into the gradual and lush months of spring, attention is now allocated toward the growing season. From planting trees, flowers, garden variety vegetables and fruits to agricultural commodities; the foundation to a successful growing season comes down to weather and its critical role in growth and development.

Growing Degree Days: What Are They?

Growing Degree Days (known as “GDD’s”) are a specific measurement to quantify the amount of energy in the form of heat that’s accessible for plant or crop growth and development. In particular, it measures specifically the number of degrees above a base temperature that a crop or plant is exposed to over a certain timeframe.

The base temperature is the lowest temperature which a specific vegetation can grow, which is fundamentally positioned around 50°F for a large portion of plants.

The Importance and Relevance of GDD’s

This quantification is a very useful tool for anyone in the industries of landscaping, farming, and research and development. It’s also simply useful for anyone in general wanting to grow a certain food, crop, flower, etc. It’s important because it renders insight and helps make decisions about when to plant, harvest, and fertilize.

Each plant has a different threshold for both temperature and light. GDD’s help estimating when a plant will reach a certain stage in development. For example, at 2,800 GDD’s is when wheat would reach maturity; however, tomatoes

only require around approximately 1,500 GDD's. Therefore, it'll vary amongst each plant. What's interesting to note is that the GDD for each plant never changes! If one were to know this, you then can take this knowledge and predict when a crop or flower produces fruit.

When it comes to weather and patterns, we know that temperature plays a major role as obvious and apparent as it is. While predicting weather daily can come with its difficulties, there are certain larger scale atmospheric climate patterns like El Nino's and La Nina's that make predictions easier to follow on a seasonal basis.

If a farmer for example wanted to get an idea for the upcoming Spring season in a certain climate pattern, you can look up past years like analogs that also had either El Nino or La Nina years and deduce what that season was like in terms of the average temperature for that month. This helps prepare for how much you want to grow or what limitations it may have, thereby mitigating potential profit hits for instance.

Lastly, GDD's help you maximize the yield potential and minimize waste of the plants or crops by optimizing planting and harvesting schedules. One can time a certain plant with the growing season and harvest if you know your GDD for that specific crop to reach maturity. What about certain pests? You can use this knowledge to even predict when certain larvae hatch since they operate on a GDD

schedule as well! Combining knowledge of weather and antecedent information, you can predict when to even use pesticides and herbicides.

How Do We Calculate GDD's?

In order to do this, you first must need to know the base temperature for the plant you're going to want to grow. Typically, this is going to be around 50°F by near default. Then, you must know the daily high and low temperature of that day.

Next, calculate the daily average temperature by adding both the high and low, then dividing by two. That now becomes the standard GDD value. Next, simply subtract the base temperature from the daily average temperature.

Example: If today's high temperature is 85°F and the low temperature is 74°F, how many GDD's would be accumulated for corn today?

$$85+74/2 = 79.5 \rightarrow 79.5 - 50 = \mathbf{29.5 \text{ GDD's}}$$

So, it's important that you know more specifically what the base temperature is for that plant. In the case you get a value less than zero, then that daily GDD

value is set to zero and therefore it means no growth or development occurred or will do so.

With all this information presented above, you can now see how this powerful tool can ascertain plant growth and development with the right information for your certain crop of interest based on geographical location.

If you're interested in this helpful information and want to know more about how to go about gauging a GDD for a certain plant, or get insight into temperature predicitions, check out this insanely helpful link: <https://data.usanpn.org/vis-tool/#/explore-phenological-findings>. Happy Planting!

