

What Are Growing Degree Days?

This year (2010) we see a lot of weather and crop reports for NY State saying crops are ten days to two weeks ahead of normal for this time in the crop season. Ever wonder what that is based on or how it is tracked? It is done using Growing Degree Day (GDD).

Crop plants require heat from their atmospheric environment to develop, grow, and mature. The effect of heat is cumulative as the growing plant progresses through its life cycle. Temperature is an indirect measure of the heat available in the atmosphere. Heat sufficient to cause growth and development in a plant is indicated when the daily mean temperature warms to a certain level, called the base or threshold temperature. Below (cooler than) this level there is essentially no growth. Different species of crop plants have different base temperatures. Cool season crops such as hay crops use 40 deg. F as the base, and warm season crops such as corn and soybeans use 50 deg. F as the base. In New York State, we use the 50 deg. F base from April 1st to calculate the seasonal accumulation of growing degree days for the season allowing us to easily compare growing season. It can also be used to help predict insect development, allowing us to better know when to expect different insect problems. Weekly weather and crop reports for New York State can be found online at:

http://www.nass.usda.gov/Statistics_by_State/New_York/Publications/Crop_Progress_&_Condition/index.asp

Degree days are often known as heat units or thermal units; they are the summation of temperature over time. Usually degree-days are only counted above a lower temperature threshold, sometimes an upper threshold is also used. Degree-day concepts are explained in detail at the UC Davis website:

<http://www.ipm.ucdavis.edu/WEATHER/ddconcepts.html#Degree-day%20concepts> . Degree-days are commonly used in agriculture and natural resources management to predict events and time management activities, such as when to sample or control a pest problem.

For specific information on how to calculate growing degree days, refer to page 8 in the “2010 Cornell Guide for Integrated Field Crop Management” online at:

<http://ipmguidelines.org/FieldCrops/content/CH02/default-2.asp>

More information about growing degree days is available from the following websites:

<http://climod.nrc.cornell.edu/static/glossary.html> - basic info

<http://www.hort.cornell.edu/gardening/weather/gdd.html> - Base 50 calculations

<http://ccesuffolk.org/assets/Horticulture-Leaflets/Using-Growing-Degree-Days-for-Insect-Pest-Management.pdf> - Using Growing Degree-Days for Insect Pest Management