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# Growing Degree Days for Insect Management

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Over the last few years Cornell Cooperative Extension has used growing degree days (GDD) as an environmental control method for insect management. When control is needed, growing degree days and observation (scouting) can be used as a guide for timing control actions.

Insect development may vary from year to year by a couple of weeks depending on weather differences. This makes predicting the proper time for initiating control measures difficult. The calendar method for timing insecticide application does not take temperature into account. This can be misleading as it pertains to insect activity, especially if scouting practices (looking for insects) are not incorporated.

## Obtaining GDD Data

The GDD method takes into account the average daily temperature accumulations that influence insect development. For each day that the average temperature is one degree above the base temperature, one degree day accumulates.

Due to temperature differences, insect development may vary from year to year and among locations in any given year. At this writing the variation in temperature across Long Island is extreme, with Oyster Bay at 156 GDD and Dix Hills at 284 GDD. (Only 11 miles separate the two locations.)

Temperature data to calculate GDD is collected at many locations on Long Island. GDD accumulations for these locations are available from March 1 to Sept. 30. Call 516 228-0426 between 10 am and 12:30 pm, Monday through Thursday and request the GDD information from the Master Gardener.

## Calculating Growing Degree Days

The temperature at which growth starts for woody plants in the Northeast is approximately 45 to 55°F. To standardize the calculations, the base temperature has been arbitrarily set to 50°F. The following formula is used to calculate GDD.

$$\frac{\text{Maximum + Minimum temperature}}{2} - \text{Base temperature (50)} = \text{GDD}$$

***Example:***

If on March 3 the maximum temperature is 60° F and the minimum is 50° F, then the GDD for March 3 is:

$$\frac{60 + 50}{2} = \frac{110}{2} = 55°\text{F}.$$

**55°F. - 50°F. = 5 GDD**

The GDD numbers accumulate each day between March 1 and September 30. Negative numbers are not added to the accumulations. For the system to work, maximum and minimum temperature must be collected every day. Early in the season the numbers accumulate slowly, but as the average daily temperature increases, the GDD accumulates faster.

The GDD for insect pest control is expressed in a range of numbers beginning with first noticeable feeding injury and continuing until approximately the end of the insects' plant injury cycle. For example, Cooley spruce gall adelgid GDDs are 22-92 and 1500-1775. This means the insect becomes active around 22 GDD and control measures can be implemented until approxi-mately 92 GDD. Cooley spruce gall adelgid has a second period during the growing season when controls may be effective and necessary. This period is between 1500 and 1775 GDD.

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