(Trees & Night Lighting continued)

Table 2. Light given off by selected lamps in the red (580-700 nm.) wavelengths as a percentage of total visible light produced.

Lamp	Red light
Incandescent filament (Standard frosted)	66%
High-pressure sodium	65%
Metal halide	50%
Florescent (cool white)	34%
Mercury (clear)	7%

Mercury lights are the best for trees. These lights may not be the best where trees and humans coexist. Metal halide lamps may represent a compromise. Metal halide lamps produce red light but they do not attract insects the way the rich blue colored mercury lights do. Insect activity around a lamp can be a problem. Also, some lamps are more energy efficient than others.

Degree Days as a Pest Management Tool

Insect development takes place at approximately the same rate as plant development. This makes sense if you consider that if this did not occur, the insects would be left without a reliable food source.

The temperature at which growth starts for woody plants in the midwest is approximately 45-50 degrees Fahrenheit. To standardize the calculations, the base temperature has been arbitrarily set to 50 degrees. To calculate DD the following formula is used:

$$\frac{\text{Maximum} + \text{Minimum Temp.} - \text{Base Temperature (50)}}{2} = \text{DD}$$

Example: If the maximum temperature on March 1 is 60 and the minimum is 50, then the DDB50 for March 1 is:

$$\frac{60 + 50}{2} = \frac{110}{2} = 55\text{ F} - 50\text{ F} = 5\text{ DDB50}$$

Degree-days values are totaled daily, and accumulate as the season progresses. For any days when the temperatures average below 50, the degree day accumulation is zero. Temperatures averaging lower than 50 are not subtracted from the total.

The degree day method takes into account the average daily temperature accumulations which influence insect and plant development. For each day that the average temperature is one degree above the base temperature (which in this case is 50), one degree daily accumulates. Due to temperature differences, insect development varies from year to year, and among locations; therefore, the calendar method for timing insect activity is less accurate than using degree-days. For example, at the Chicago Botanic Garden, which is close to Lake Michigan, temperature accumulation is typically around 100 degree-days (base 50) behind suburbs that are further west, such as Lisle, where the Morton Arboretum is located.

The use of degree days in conjunction with phenology data, such as that found in **Coincide**, by Don Orton increases the accuracy of timing pest controls. For example, birch leaf miner is listed as being in the young larval stage at the same time that Robinia pseudoacacia (Black locust) is in bloom. The corresponding degree-day range is 275-500 DDB-50. By observing the actual degree-day values that occur when Robinia is in bloom, and birch leaf miner larvae are present, you can arrive at a more accurate time for treatment in your geographic area. If you don't have the indicator plants around, you can begin monitoring shortly before the beginning number of degree days listed in the range.