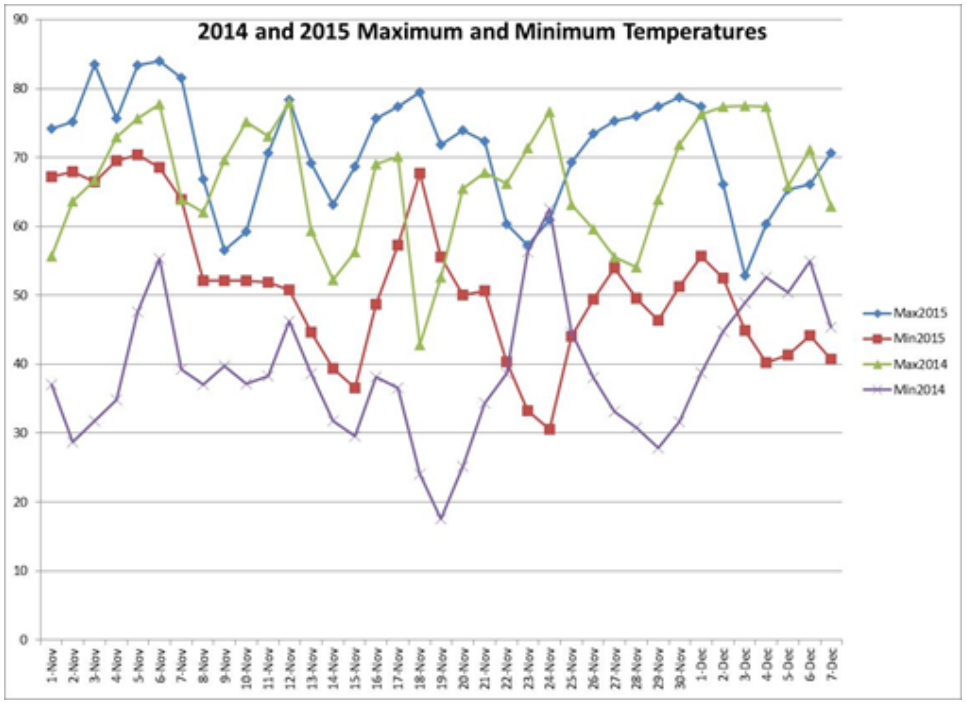
Nursery Cooperative MANAGEMENT ALERT 2015 - 02

SEEDLINGS NEED COLD WEATHER FOR FREEZE PROTECTION

Living in the southern United States we have come to realize that the phrase "normal winter" is a phrase that is seldom experienced and much less duplicated over two consecutive years. For those that live further north they would find that beginning in November, the maximum and minimum daily temperatures begin to drop until February when temperatures gradually start to rise. In the south we seldom see a similar trend but rather, a gradual temperature descend marked by either sudden temperature drops and or periods of high temperatures within a short period of time as large air masses swing across the southern US from Canada.

To protect from freezing, seedlings need to be exposed to temperatures that range between freezing and the high 40's. This range of temperatures begin a conditioning process within the seedlings know as cold weather acclimation. The more hours a seedling is subjected to these lower temperatures, the more freeze tolerant a seedling becomes. The more freeze tolerant a seedling becomes, the better conditioned it is to withstand temperatures that rapidly drop below freezing. Seedlings that are properly acclimated to the cold weather are many times able to survive cold temperatures in the mid 20's. However, research conducted by the Southern Forest Nursery Management Cooperative has documented seedling damage at temperatures just below freezing early in the fall when the temperatures have been so warm that there was little cold weather acclimation.

The graph to the right shows actual maximum and minimum temperatures for south central Georgia for this year and last year from November 1 until December 7.



As noted on the graph, both the maximum and minimum temperatures this year have been much warmer than for the same period in 2014. Nursery managers, tree planters, consulting foresters and seedling customers need to be aware that so far this year (2015) seedlings have received a minimum number of cold weather hours that would help protect seedlings from sudden temperature drops. Also, another point of concern is that any cold weather acclimation that has occurred to date (December 8) may have been compromised due to the usually warm day and night temperatures. When cold weather deacclimation occurs, depending upon the time of the winter, seedling may be susceptible to freeze damage.

The temperatures presented in the graph above are only for one location. The amount of cold weather acclimation and deacclimation will vary from geographic area to another.

Once the low temperatures are consistently in the range from freezing to the high 40s and the frequency of periods of warm day and night temperatures begin to decrease, seedlings will begin to accumulate cold weather protection and the threat of freeze injury to seedlings will decrease.