Management Alert 20-01

Southern Forest Nursery Management Cooperative

BE ALERT OF UPCOMING FREEZE INJURY CONDITIONS

This coming weekend specifically, Sunday, January 19, 2020, will be the coldest weather the southern US has experienced this year. ***Extremely cold weather conditions forecast for this weekend and early next week may affect newly planted seedlings.*** There is always a potential for freeze injury when seedlings are exposed to extremely cold temperatures. Of concern is that the recent warm evening temperatures (>46°F) experienced are likely to result in the de-acclimation of seedlings to freeze injury (South et al. 2008). This weekend, January 19, 2020, temperatures are expected to go below freezing (Figure 1). These cold temperatures are of concern for landowners who have recently planted or are in the process of planting seedlings for reforestation. **Freeze injury or seedling death is a possibility.**

The accumulated chilling hours for a central Georgia location show that, from the 1st of October 2019 until the 17th of January 2020, there are 302 accumulated hours (Figure 2). Accumulation of chill hours is correlated with freeze tolerance to seedlings. It needs to be emphasized that *there is no set number of chill hours above which freeze injury will not occur*.

Points to Consider:

1. Despite the number of accumulated chilling hours to date, the root system of southern pines never go dormant.
2. Seedlings should not be planted when the temperatures are near freezing. We would not recommend any planting of new seedlings until the daily highs are above freezing and the low temperatures have moderated.
3. Recently planted seedlings have not begun to grow new roots and the soil around the root zone may not have properly settled around the seedling.
4. A positive point is that the recent heavy rainfall may help moderate the soil temperatures.
5. The impact of these temperatures may not fully be known until seedling growth begins in the spring. Landowners should be diligent to check seedling survival for several weeks beginning in the spring.
6. If we have a period of moderate temperatures over the next few months, it may be possible to check seedlings for freeze injury by following the steps outlined below.

Keep Alert:

1. Nurseries: Monitor your soil moisture during warm nights and days and irrigate a couple of days before the temperatures drop below 25°F. Moisture in the soil will help insulate the seedling roots.
2. Following a possible freeze injury event, monitor seedlings by outplanting at the nursery 10-20 seedlings from any families you consider freeze sensitive. Keep these seedlings until at least June of next year. This will provide an indication of whether the seedlings shipped from these same families may have freeze injury.
3. Following a possible freeze injury event, plant 5-10 seedlings from freeze sensitive families in 1 gallon pots and keep in warm location. After 7 days, gently scrape the bark 2" above and below the root collar to check for freeze-injured brown tissue.

How to Check for Freeze Injury for Outplanted Seedlings:

1. Wait for 1-2 weeks or until the temperatures have warmed up. Repeat again in several more weeks to confirm.
2. Scrape the bark away from the stem, from about 2" above the root collar down into the root system.
3. Look for light brown colored tissue, which is an indication of freeze injury (Figure 3).
4. Many times the brown coloration will be limited to one side of the stem. These seedlings may survive if environmental conditions are favorable; however, first year growth will be impacted.
5. If the brown coloration covers the entire circumference of the stem, the seedling will most likely die.

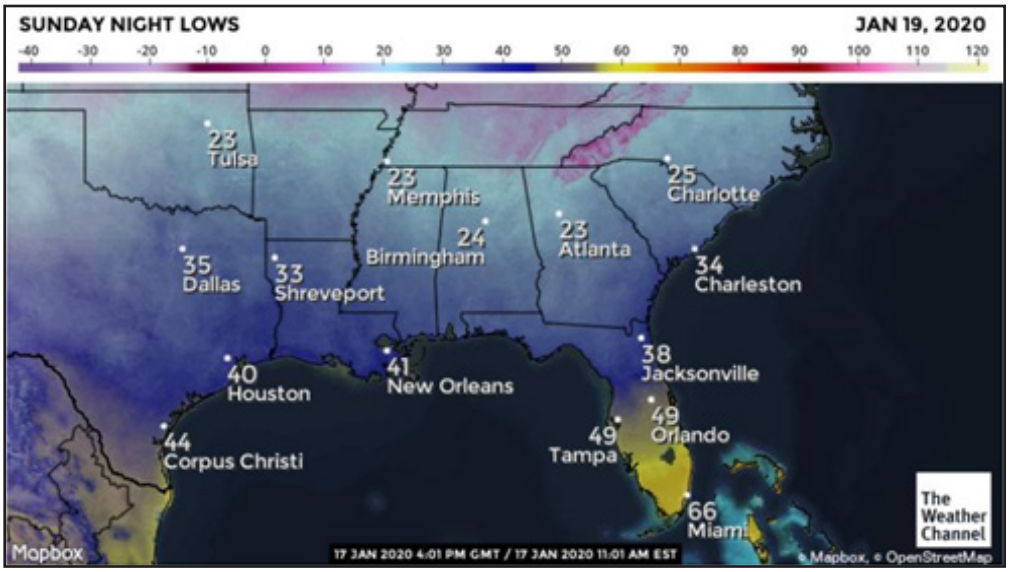

Figure 1. Predicted cold weather predictions for January 19th (www.weather.com).

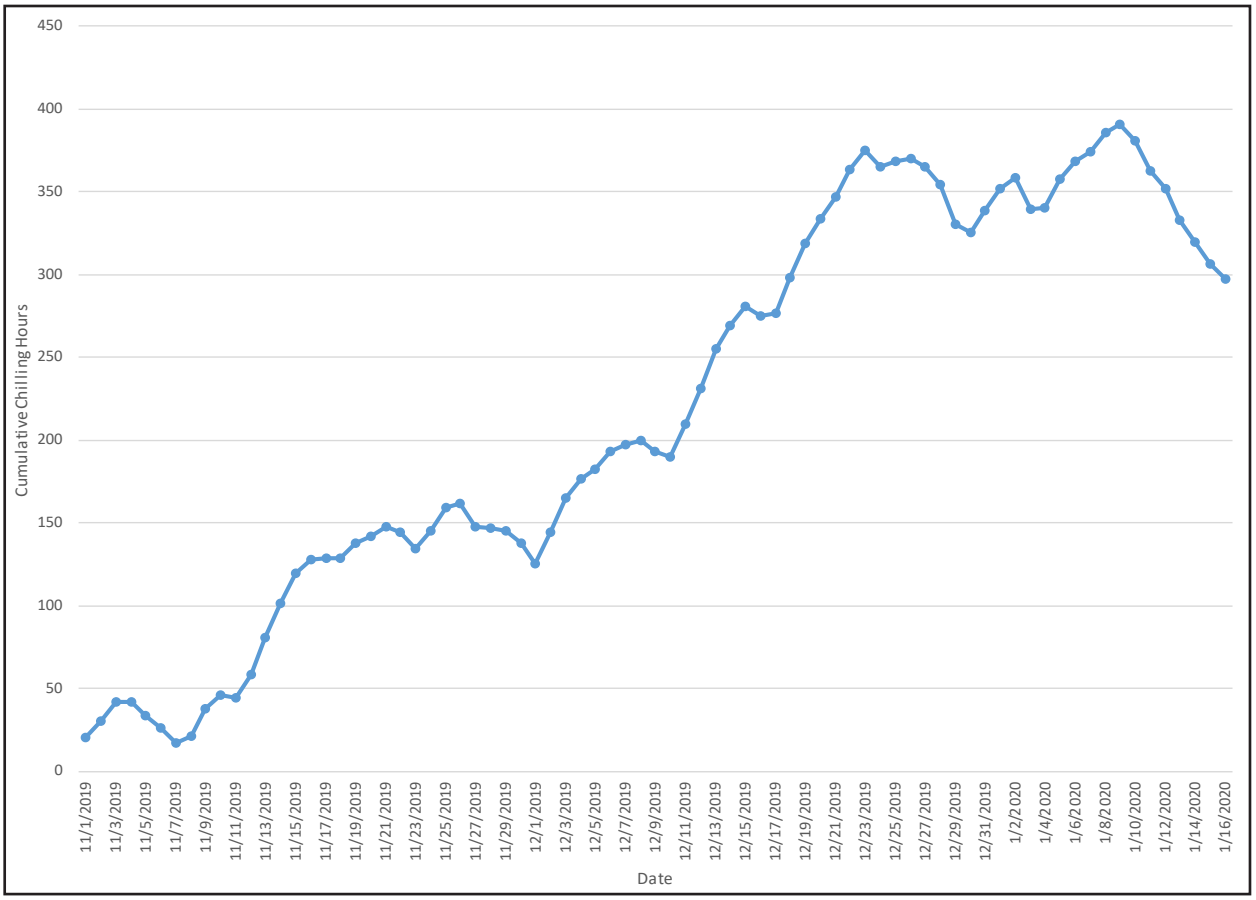

Figure 2. The accumulated chilling hours for a central Georgia location show that from the 1st of November 2019 until the 14th of January 2019 there are 302 accumulated hours.

Figure 3. Light brown colored tissue, which is an indication of freeze injury.