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News Release

Potential Freeze Damage to Landscape Plants

The good news is the weather was relatively cool this fall and plants did start to acclimate to the cold weather. The bad news is it is really cold and for marginally cold tolerant plants acclimating to extreme cold is not possible. This is especially true of most sub-tropical plants and half hardy perennials. If you are a gardener who likes to push the hardiness zone to extremes, you will be saddened this spring when those marginal plants disappear. Follow this link for the USDA hardiness zone map (<http://www.usna.usda.gov/Hardzone/index.html>).

The news is better for more cold hardy species of woody plants. In these plants cool temperature initiates the accumulation of sugars, modification of proteins and changes in cell membrane permeability – all of which increase the plant's cold hardiness. While most plants require both short days and lower temperatures to develop full cold hardiness, other plants harden only in response to low temperature regardless of the day length.

Once leaves and stems of evergreens harden enough to withstand freezing, becoming frozen makes them even hardier. Note* - the freezing response is strictly localized and is not general to the whole plant. In other words, if lower leaves are acclimated to freezing that does not necessarily mean the upper leaves are also hardened. That is why plants will sometimes burn back from the youngest leaves while the interior has little or no damage.

For woody landscape plants, low temperature injury, often called freeze damage, can be caused by intra- or extra-cellular ice formations within the plant. When intra-cellular ice is formed, crystals originate inside plant cells. This type of ice formation would be extremely rare in Alabama's hardy plants and it is unlikely to occur during this cold spell. The other more likely type of freeze damage occurs when extra-cellular ice forms during normal cold winter conditions. This means that water moves out of plant cells as temperatures approach 32°F to prevent freeze damage and then back into cells for hydration when the temperature rises above freezing. This type of freeze damage is not lethal to most woody plant species that have been properly acclimated and are cold hardy to at least zone 7a in North Alabama and zone 7b in Birmingham and Central Alabama. Injury can occur; however, if the cells are dehydrated for relatively long periods of time, or subjected to very low temperatures that they cannot tolerate.

For the more cold hardy woody plants, the freezing and subsequent rapid thawing can actually be more damaging than a sustained cold period. It would be better for the plants to thaw slowly to

avoid bark splitting. If you have newly planted shrubs or young trees with exposed trunks you may consider wrapping them before they start to thaw to prevent this rapid thawing action.

Normally we don't have a problem with root damage but a little extra protection may be useful with the predicted, prolonged cold temperatures. Apply a layer of mulch, 2 to 3 inches deep, after the soil freezes to keep the soil cold rather than protect the soil from becoming cold. This practice will reduce injury from plant roots heaving (coming out of the soil) because of alternate freezing and thawing. Plants that benefit from this practice include perennials, rock garden plants, strawberries and other shallow-rooted species. A mulch maintains a more even soil temperature and retains soil moisture as well.

Apply bark products, composts, pine needles, straw, hay, or any one of a number of readily available materials from the local garden center. Also, pine boughs or Christmas tree remains can be propped against and over evergreens to help protect against damage from rapid thawing mentioned earlier. Place this cover on the southern exposed side of the plant where the sun strikes the tree causing rapid thawing.

Winter annuals such as pansies and flowering kale should survive but pansy blooms will be knocked off and they won't look very good for a few weeks. Less cold-hardy cool season annuals such as snap dragons may not make it through this event. Most turf grass should make it through the cold unless it was fertilized too late in the fall or planted too early to root in well before the cold hits.

Only time will tell how much damage plants have sustained but keep an eye on marginal woody plants this spring because they may be more susceptible to borer and beetle attacks after winter cold injury.

For more information on this topic or other horticulture related questions, please contact Regional Extension Agent Tony Glover at the St. Clair County Extension office at (205) 338-9416 or email gloveta@aces.edu.