

Frost Cracks and Cankers

The Problem

Winter temperatures wreak havoc on our Midwestern landscape trees, often causing frost cankers and frost cracks on tree trunks. For many years, trunk protective wraps were touted as being very beneficial in preventing trunk damage from the sun. Unfortunately, research to date has yet to empirically and conclusively prove that trunk wraps prevent anything; they may actually cause even more problems. The conundrum is that some experience suggests that trunk damage from winter temperatures may be prevented by tree wraps applied in the winter.

Frost Cankers

Frost cankers - a.k.a. sun scald - may appear as longitudinal splits on the south or southwest sides of the bark along the main stem or branches, or simply as sunken dead areas. It is speculated that cambial tissues are damaged when trees begin coming out of dormancy and are subjected to sudden



Frost cankers (left) and frost cracks (right).

Photos by Gary Johnson.

temperature changes in the late winter/early spring.

Some young, thin and/or smooth-barked species like maples, crabapples, and lindens, seem to suffer more from frost cankers. Perhaps these young trees are more susceptible since they have yet to develop thick, outer-bark tissues. In the Midwest, frost cankers occur primarily during late winter months when the sun is heating the bark cambial tissue but temperatures are still dropping at night. Although it is common to claim that a particular tree species is susceptible to frost cankers, transplant stress, and, more importantly water stress caused by root loss during transplanting may be the leading predisposing factor to frost cankers regardless of species.

Sources

- 1) <https://hort.ifas.ufl.edu/woody/documents/articles/LAP8301.pdf>
- 2) <https://hort.ifas.ufl.edu/woody/documents/articles/RAM0101.pdf>

Frost Cracks and Cankers, cont.

Frost Cracks

Frost cankers are often mistaken for frost cracks. Frost cracks are formed during extreme winter temperature fluctuations (i.e., when temperatures plummet) and can be found on any side of the stem or branch. These are similar to frost cankers in that they are longitudinal; however, a true frost crack extends into the stem's wood.

Tree Wraps: What Do They Actually Do?

Photosynthesis occurs in the stem too! The thin bark of younger trees is composed of photosynthetic organelles that may have the ability to re-fix CO₂ during respiration, part of a process called corticular photosynthesis. Throughout the year, light penetrates the organelles and sunlight energy is trapped. As the tree ages and the bark becomes thicker and woodier, or if stems are wrapped, less light reaches the

Paper wrapping gone bad.

Photo by Gary Johnson.



photosynthetic organelles (University of Illinois, 1997). Stems are part of the photosynthetic cycle, meaning that even during the dormancy of winter the sugars necessary for a young tree's life can be produced.

Are Wraps Harmless?

Trunk wraps or other protective wraps have long been used to protect against winter temperature fluctuations. However, one report found that commonly used paper tree wraps may do the opposite of this theory, they actually cause a faster rate of temperature change¹. Trunk protection via paper wraps and plastic guards has also been found to retain moisture between the wrap and the tree,

Sources

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Frost Cracks and Cankers, cont.

which creates an inviting haven for insects, fungi and bacteria. So avoid the problem and remove all stem coverings before spring weather begins if you choose to use these products. Finally, the worst scenario is plain forgetfulness. If a person forgets to unwrap the materials on the growing tree, the wrap remains in a fixed position and may eventually girdle the stem, possibly hurting or killing the tree.

What Does Help?

Here are some research-based recommendations.

1. Avoid water stress in newly planted trees. Predisposition to frost cankers has been associated with trees stressed by root loss and dry soil conditions. Water the upper 6-8" of the soil– but don't flood it! - throughout the growing season until the soil freezes for 1-3 years for a newly planted tree.

2. Don't stress your trees! Plan before you plant. Frost cankers and other preventable problems are often caused by stresses that result from putting sensitive trees in poor locations such as water-logged soils, constricted rooting areas, dry and sandy soils, or areas surrounded by concrete or black top.

3. Do not wound the tree's stem. One of the main causes of frost cracks is a "flush cut" pruning wound, or any accidental wound to a young tree's trunk. For proper pruning techniques visit: http://www.na.fs.fed.us/spfo/pubs/howtos/ht_prune/prun001.htm

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Sources

- 1) <https://hort.ifas.ufl.edu/woody/documents/articles/LAP8301.pdf>
- 2) <https://hort.ifas.ufl.edu/woody/documents/articles/RAM0101.pdf>