

## Garden Update

By Kathleen Cue, Nebraska Extension Horticulture Educator in Dodge County

### Spruce Trees

Many spruce trees in the area are looking rough. Beyond the usual injury from spruce spider mites and *Rhizosphaera* needle cast, spruce trees have serious dieback, not only individual branches but in some cases, the top has died. Drooping clusters of brown needles and streaks of white sap on branches and trunk indicate freeze injury.

While late April is our last average frost date, early May saw a deep drop in temperatures, bringing frost. Much of the new growth in spruce trees was damaged by this cold spell. Spruce trees are well-suited to cold temperatures, but new growth is not. New twigs and needles develop thickened cell walls (called lignification) as they mature, needing the bulk of the growing season to complete this process. Spring's new growth simply didn't have enough time for lignification to take place before the cold set in, resulting in collapsed tissues and death to ends of branches. While these dead areas will eventually fall away, pruning out dead twigs can also be done.

The same weather conditions brought about the white streaks of sap on tree trunks and branches. As spring weather warms the atmosphere, sap flow rises from tree roots, bringing much needed water, nutrients, and stored sugars, distributing throughout the tree. Freezing cold will cause the water in sap to freeze, bursting cell walls and causing cracks in bark. Sap leaks from these wounds, eventually turning white as it drips down the trunk and branches. Often, secondary infections take place, with *Cytospora* fungal pathogens entering wounds and expanding damage in water-conducting tissues. In some cases, the top of the tree dies completely.

When the top of a spruce or other conifer dies, the form of the tree can be salvaged by re-establishing a central leader. The dead leader is cut away and a side branch is gently curved upward and secured to a stake placed along the trunk. Staking materials must be removed in one year to keep materials from causing further damage to the tree.

There isn't anything to counter freeze damage and the resulting *Cytospora* infection. While tree owners want to help, fertilizing these trees should not be done as this results in deepening tree stress. Practicing good tree care is an excellent step: water deeply during dry spells, mulch with 2-4 inches of wood chips, and refrain from using any herbicides containing dicamba anywhere near trees. By practicing good tree care, the tree's own defenses are enabled to weather setbacks.

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