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Reaching for the Light—How Trees Grow

SIMPLY TREES for October 2015 by Eric Berg, Nebraska Forest Service

In most forested environments, the name of the game for tree survival is, “Who can capture the most sunlight, grow the fastest and tallest and eventually shade out any competition for sunlight, water and nutrients?” It is a competition that typically takes years to play out and often decades to see the full result. This competitive process generally results in tall, straight trees with few branches, most of which are strongly attached to the trunk at right angles.

In a sense a tree is simply a collection of branches, with each branch serving as an independent subdivision, i.e. a tree on a tree. Branches manufacture their own food through photosynthesis and export a portion of that food to the trunk and root system below. As long as the branch continues to produce more food than it uses, it continues to grow and support the rest of the tree. The forested environment forces this system and process to be efficient, effective and ruthless. Trees or branches that are not able to capture enough sunlight don't produce enough food and die back. This time-tested process of Mother Nature works well in forested environments.

But if you take that same tree from a tightly-packed forest and move it to the “community forest,” the collective landscape of our cities and towns where the great majority of us live, the environment is very different. Whereas sunlight was one of the most limiting resources of the forest, sunlight is now one of the most abundant and, quite frankly, abused resources. That's right, you heard it here first, our community trees have an overuse problem with sunlight, and we need to talk about that openly and frankly.

It's important to talk about because trees provide valuable social, economic and environmental benefits in an urban environment. They shade our homes, provide food, slow stormwater, reduce flooding and protect us from winter winds, to name just a few. Perhaps even more important is that they create and define a sense of place. But urban settings are a tough place for trees that originated from a forest.

Trees that abuse and overuse sunlight are easy to spot; you probably have one in your very own yard. But you're not alone. Most of the trees growing in home landscapes, on streets and in parks were planted individually rather than in groups. How do you know if your tree has a problem? If it's short and wide with multiple stems and many competing, co-dominant branches, it isn't growing “naturally.” If the branches grow at shallow angles of 45 degrees or less rather than being strongly attached at 90 degree angles, that predisposes them to stress or ripping out in strong winds or storms.

All of this is preventable if we take the time to notice, mimic and manage like nature. This means grouping similar plant materials together, separating trees in mulched beds away from turfgrass and planting a diversity of woody plant materials closer together to force a more naturalized and structurally stronger growth pattern. With careful landscape design and management, we can create landscapes with trees that are healthier, stronger and more capable of withstanding the extreme weather of the Great Plains. So take a closer look at your trees and see if they're suffering from “sunlight abuse.” If they are, take some steps to help them toward a more structurally sound future.