Urbanization Affects Tree Longevity

*By James A. Fizzell**

We have suffered significant losses of trees throughout Chicagoland the last few years. Some of these were big, old trees; but some were not.

Planting a tree is usually considered an exercise for the benefit of future generations. We plant for posterity, expecting trees to outlive us, and to be enjoyed by our kids and their kids. In an urban setting, some sites will allow a tree to live a long life, others may severely limit longevity. In fact, analysis of the site will provide us with a relatively good measure of how long we can expect a tree will last in a particular spot. Other factors may contribute as well.

Some of the trees that have expired of late went prematurely because of their situations. Their demise should have been anticipated and expected.

There are at least a dozen good reasons why urban trees have finite, predictable life spans. These include urban intensity, the planting site and soil volume, the kind of soil and what's under it, amount of light, wind, pollution, pests and diseases, mechanical damage, the species, and the care or treatment the tree receives.

Urban intensity has a major impact on the life span of a tree. According to a study by the Urban Forest Forum, the average life of species commonly grown as shade trees is about 150 years in rural areas. In the best city sites this is reduced to about 60 years. The over-all average life span of city trees, is about 32 years; and in downtown locations this is reduced to something like 6 or 7 years. Usually, some of the above factors combine to cause this phenomenon.

The planting site and the volume of soil available to the roots have major impact on the longevity of the trees. A 25 inch tree requires at least 1200 cubic feet of soil. At a depth of 3 feet, this means an unobstructed area of at least 20 by 20 feet. Only large yards, parks and golf courses in urban locations have such open expanses. Our common species of shade trees will reach a 25 inch caliper at an age of somewhere between 26 and 40 years, At that age, the 1200 cubic feet of soil volume essentially are filled with roots, and the tree has become root-bound. Decline sets in.

More common in the city are areas of about 10 by 10 feet, or 300 cubic feet of soil. 300 cubic feet of soil will support a 12 to 15 inch tree to an age of 15 to 25 years. Tree lawns or parkways between the curb and walk are often 8 feet by 4 feet or 96 cubic feet in volume. These will support trees to a size of 8 to 10 inches and an age of 10 to 15 years.

Tree pits common in inner-city locations are often no more than 4 feet by 4 feet and contain 48 cubic feet of soil. These are containers which will support a 3 to 6 inch tree to an age of about 10 years. Roots of a 4-inch tree planted in a pit of this size will fill it in about 3 years.

Trees planted in 36-inch tubs will survive up to 3 or 5 years and will reach a size of 1-1/2 to 2-1/2 or 3 inches. Plants set into inhospitable soils into which roots cannot grow, or plants grown in soils vastly different than those into which they are planted are likewise affected. These plants are in what are commonly referred to as contained soils and behave as though they were in pots or tubs. They are forced to grow in the soil contained in the ball.

Additional adverse conditions may reduce the lives of trees in cramped quarters even

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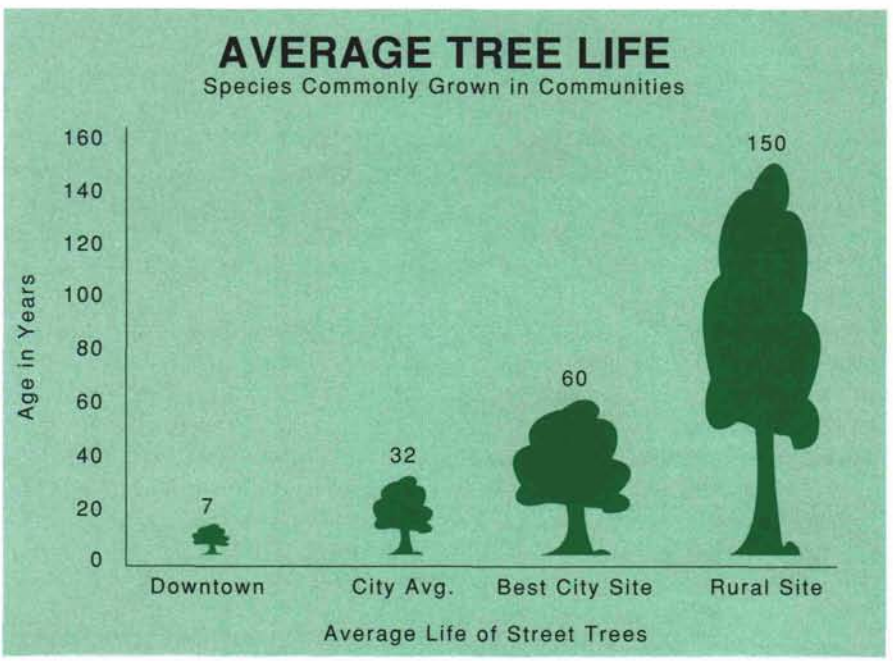

Winterkill of Turfgrasses...
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Before applying any type of protective layer or covering to a green or tee, it is important to make the appropriate applications of fungicides for snow mold control. The coverings, while protecting the turf, also create a microenvironment that is conducive to the development of the snow mold diseases.

Even adapted. acclimated turf can be killed by low temperatures, however. if the turf is extremely thatchy. The thatch does not retain heat as well as the more dense soil, and the effects of extreme cold on the turfgrass plant are not as well-buffered. Thatchy turf is also likely to become desiccated, thus subjecting the grass plants to two forms of potential winter injury.

Frequent and/or heavy traffic on frozen turf can also cause injury or death. This is a type of low temperature injury because the traffic causes ice crystals, that have formed inside the dormant plant to puncture cells and destroy tissue. This is similar to the damage that occurs following traffic on actively-growing, frosted turf in the fall or late spring.

Finally, a winter-related problem that few superintendents seem to be aware of is that of the winter mites. I believe that much of what is attributed to "winterkill" or winter desiccation is actually caused by the activities of these small mites. The mites feed heavily on turf during the late winter and spring, causing the turf to become bleached and desiccated, generally resulting in death. It is not surprising that mite injury is mistaken for winter desiccation. They are most active on south or west-facing slopes, along the south or west-facing sides of buildings or walls, and around the bases (especially the south side) of evergreen trees (especially spruces). Their populations skyrocket on drought-stressed area. They can be found on any species of turf, and are most easily seen feeding on the tips of grass leaves late in the afternoon on sunny days. Irrigation seems to reduce mite populations significantly; variable levels of control are seen with Diazinon (not on the course!) and Dursban, Talstar 10W, a miticide that is quite effective against these critters, has a 24c registration in Colorado that allows use on turfgrass. Apply 2 to 4 tablespoons per 1000 square feet in 1 gallon of water, and do not irrigate in. This is highly toxic to fish and use near water is prohibited. ■

Credit: Rocky Mountain Reporter-Vol.26, No.11

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of its affiliates. Future programs Bruce discussed that the GCSAA will offer its members are very promising indeed, from an on-line continuing education program to be unveiled at the 1997 Conference and Show in Las Vegas to computer terminals for each chapter for communication uplink between chapters and the GCSAA. The success of these progressive programs relies heavily on chapter affiliation, and thus on member involvement.

Discussing these and other issues with Bruce Williams leaves us with several lasting impressions, the most apparent being that our Association—the GCSAA—is poised to continue its growth and pro-active nature, and that it could not be in better hands than those of our own Bruce Williams. ■

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more. Use of smaller or slower-growing varieties, and exceptional attention such as careful watering, fertilization, pruning, etc., may prolong the usefulness of trees beyond what might be expected. Inevitably, these trees will take increasing amounts of attention and eventually will require replacing.

Even though the lives of trees planted in adverse situations will be shortened, this in no way means that such trees should not be planted. Such trees fill a vital need, softening the harsh urban environment, providing shade or screening, or just providing something attractive to look at.

When trees are used in such a manner, it is important that everyone involved recognizes that these are temporary plants and will need to be replaced periodically. If the condition in which the trees are being used is understood in advance, and if replacements are anticipated and budgeted, there will be far less trauma when the plants begin to outlive their usefulness and replacement becomes necessary. ■

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