JB Comments

Turfgrasses Versus Trees and Shrubs in Water Conserving Landscapes

There are certain adversary groups that continue to be active in promoting the reduction of turfgrass areas within urban landscapes and the replacement of the areas with trees and shrubs as a means of water conservation. **Statements have been published such as "all turfgrasses are higher water users than trees and shrubs." This is totally false.** Actually, the major grasslands of the world are located in the semi-arid climatic regions, whereas the major forests of the world are located in the high rainfall areas.

Just what is our current state of knowledge backed by sound scientific data concerning these issues of proper plant use for water conservation within the urban landscape?

- Very few of the many hundreds of tree and shrub species available have actually been quantitatively assessed for their water use rates.
- In contrast, a major portion of the turfgrass species have been assessed for water use rates.
- The few comparative water use studies that are available prove that the commonly used trees and shrubs are much higher water users than turfgrasses, especially when soil moisture is available. This is based on the sound scientific premise that the rate of water use increases with leaf area.
- Much confusion has arisen from the "low water use plant lists." It has been incorrectly assumed that those plants capable of surviving in arid regions are in fact low water users. However, the physiological mechanisms controlling the water use rate and drought resistance are entirely different, and are in no way directly correlated across plant species.
- For unirrigated sites, detailed studies have been conducted on drought resistance and dehydration avoidance of many turfgrass species and cultivars. Results have shown that a number of warm-season turfgrass cultivars can survive 158 days in a sand root zone without irrigation under the hot summer conditions in College Station, Texas.
- Comparative studies of drought resistance among tree and shrub species are lacking.
- It should be recognized that when turfed areas are irrigated the adjacent trees and shrubs also are being irrigated as a result of the multitude of shallow roots that concentrate under the irrigated area.
- There are numerous turfgrasses capable of ceasing growth, entering dormancy, and losing chlorophyll during summer drought stress, that readily recover once rainfall occurs. Why assume that turfgrasses must be green throughout the summer season? Many trees drop their leaves during drought stress, or during the winter period, with only brown bark remaining. What then is wrong with a tan to golden brown turf during droughts, if one chooses not to irrigate?
- There is no valid basis for water conservation legislation requiring the extensive use of trees and shrubs, in lieu of turfed areas. Rather the sound strategy based on good science is the use of appropriate low water use turfgrasses, trees, and shrubs for moderate to low irrigated landscapes and to select appropriate drought resistant turfgrasses, trees, and shrubs for nonirrigated areas.
- In most situations it is the "human" factor that wastes water through improper irrigation practices and landscape designs.

Understanding and Minimizing

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downward leaching of the sodium after displacement from the clay particles.

- **Insect, Nematode, and Disease Injury**-There are pests which feed actively on grass root systems causing serious damage. White grubs can be particularly damaging. The appropriate pesticide should be applied to control the target pest when a serious problem starts to develop.
- **Toxic Herbicides**-A number of preemergent herbicides have a degree of toxicity to turfgrass roots. These effects may not be evident in terms of aboveground shoot growth under normal growing conditions; but can become quite striking during water stress periods when the lack of a root system restricts water absorption.

Unfavorable Cultural Factors:

- **Close Cutting Height**-As the cutting height is lowered, the depth and extent of rooting is restricted proportionally due to a decrease in leaf area available for photosynthesis.
- **Excessive Nitrogen Fertility**-Excessive nitrogen applications that force leaf growth cause the reserve carbohydrates to be drawn from the roots and may results in die-back of the root system of C3, cool-season turfgrasses. Thus, an individual nitrogen application should not exceed 1 lb N/1,000 sq. ft. (0.5 kg are^{-1}) as a water soluble carrier or its equivalent rate as a controlled-release carrier. High quality putting green turfs are maintained at a lower rate, usually not exceeding 0.3 lb N/1,000 sq. ft. (0.15 kg are^{-1}) of a water soluble nitrogen carrier or equivalent as a controller-release carrier.
- **Deficiencies of Potassium or Iron**-These two nutrients can have a striking effect in enhancing root growth and should be maintained at high available soil levels. Chemical soil tests conducted at 1- to 3-year intervals should be used to establish proper base levels of both nutrients. Also, additional potassium should be applied at a rate that is 50 to 75% of the nitrogen rate used.
- **Excessive Thatch Accumulation**-A thatch problem causes a high percentage of the roots to be concentrated in the thatch layer, thus limiting the zone from which water uptake occurs.