U of M Update —

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such as water use and conservation in the landscape. According to a recent article by Dr. James Beard and Dr. Robert Green*, our turfgrasses are and should remain a vital if not essential part of our urban landscapes, not to the exclusion of trees and shrubs but in coexistence with them. Following is a brief summary and adaption of the water conservation section of that paper as it appeared in the *Journal of Environmental Quality,* May-June 1994.

Proponents of xeriscaping as well as others have often encouraged reduction of turfgrass areas while increasing the use of trees and shrubs as a means of conserving water in urban areas. However, if one were to look for scientific data to support that view, you would find the reference shelf empty. In fact, from the limited research that is available, the opposite position would likely be supported. That is, our turfgrasses may be more effective water conservers than our trees and shrubs.

One basis for evaluating their ability to conserve water is to study their evapotranspiration (ET) rates. Remember, ET is the measure of water lost through evaporation and transpiration through the plant. Very few tree and shrub species and cultivars have been examined for their ET rates while many of our turfgrass species and cultivars have been evaluated. Comparing those ET studies that are available, trees and shrubs are typically found to be greater water users than our turfgrasses on a per unit land area basis. It should also be noted that the major world grasslands are located in semi-arid regions, while forests are located in areas of higher rainfall. Minnesota is a good state to observe this phenomena as you travel from the Arrowhead region in the northeast at the more arid southwest corner.

Many plants mentioned on low water use lists are based on the inaccurate assumption that survival in arid landscapes equates to low water use rather than their being only drought resistant. These same species placed under an irrigated urban landscape often become high water users. This results from the fact that the plant mechanisms for dealing with ET and drought resistance are distinctly different. Results from research in Texas have found a number of turfgrass genotypes capable of withstanding and remaining green 158 days without irrigation under hot summer conditions through dehydration and avoidance. At this time, similar detailed studies of dehydration avoidance and drought resistance among trees and shrubs is lacking.

Many turfgrass species will naturally "harden off" or acclimate to the warm dry conditions of summer by ceasing growth, becoming dormant and turning brown until adequate rainfall returns. Research has shown that these properly conditioned turfgrasses will recover and turn green once watering is resumed and/or ample rainfall returns. If conserving water is desired, then a dormant turf will use little water while many of our trees and shrubs continue to remove water from greater soil depths. (Note: Also, many of the trees and shrubs around the Twin Cities have been dropping both green and yellow leaves this year as a means of conserving moisture and adjusting to the drier conditions.)

While seeking lower ET rates, we must also consider the total impact of this on our urban ecosystems. As urban areas are already significantly warmer than adjacent outstate areas, lowering ET rates lessens the transpirational cooling and increases the heat load in urban areas, thus increasing the need for greater mechanical air conditioning requirements. For example, a turf in a dormant condition is going to be warmer than one receiving ample water to sustain growth and remain green. Therefore, when comparing the costs and supply of water with energy, it may be more prudent *not* to strive for the lowest possible water use in lawns and landscapes. Comprehensive research that considers the effects on all the urban landscape components is still needed to assist in the development of prudent and cost effective urban water conservation strategies.

Presently, valid scientific information supporting the use of trees and shrubs instead of turfgrasses for water conservation strategies does not exist. Improper watering practices and poor landscape planning are more often to blame than any one group of plant materials for water being wasted in the landscape. Rather, the right plant and combinations of plants for the right design and the right place in water conservative landscapes will be much more effective than singling out particular plant materials to be excluded from the landscape. Trees, shrubs and lawngrasses all have a place in maintaining the plant diversity of our urban landscapes. It is important that we not lose the positive environmental benefits that each group of plant materials can contribute to an aesthetically pleasing and environmentally beneficial urban landscape.

*Summarized and adapted from: Beard, J.L. and Green, R.L., *The Role of Turfgrasses in Environmental Protection and Their Benefits to Humans.* Journal of Environmental Quality, 23:452-460 May-June 1994.

Making a Point About Change

Having trouble persuading your staff that incremental change is worth the effort—and that change doesn't have to be immediate, dramatic and sweeping?

If so, try this exercise suggested by Richard Ruhe, a consultant with Blanchard Training and Development:

Tell staff members to imagine they've just been told they have won a state lottery and they have one minute to choose between two payment methods:

- **$250,000** a day for 30 days.
- **One cent** the first day and double the amount each day for 30 days.

To make it easier for you: The first method totals $7.5 million, the second method totals, $10,737,128.23!