

## A Global View of Landscape Use

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The opportunity to conduct extensive research on the water use rate and drought resistance of turfgrasses and more recently to lecture in 20 to 25 countries per year has given me a global perspective on landscape water use and its important role in various civilizations around the world. **It is very significant that for 11 centuries humans have chosen to devote time and resources including water for the establishment and maintenance of turfgrasses in landscapes to improve their quality-of-life.** While this desire for the enhancement of their living environment may exist worldwide, it has not been attainable in those regions where the peoples must spend all their living hours in generating food, fiber, and housing to survive. Countries who have developed an industrialized employment base in addition to an agrarian base are able to generate sufficient financial resources, such that individuals can afford to improve their living environment through landscape plants including turfgrasses. **In traveling around the world, one reaches the obvious conclusion that those countries with extensive urban landscapes, including lawns, trees and shrubs, also have associated with them a dominant population that is far more productive and where individuals live together in more harmonious interactions,** as compared to countries that are seriously deficient in the use of landscapes to improve the human quality-of-life. Two examples of very productive countries where the people interact relatively harmoniously that utilize and encourage turfgrass and landscape plants are Singapore and The Netherlands. It should be noted that both countries are burdened with some of the higher populations of people per square mile of anywhere on earth. These are two key examples of the importance and benefits of turfgrasses of landscaping.

### Australian Experience with Managing Landscape Water Use Through Plant Species Selection

In the United States, activists have been promoting the conversion of turfgrass areas to trees and shrubs as a means of water conservation. As a result, there are a number of municipalities, counties, and townships where laws have been passed dictating the reduction in turfed lawns, and the planting of trees. In contrast, the opposite is being proposed in Western Australia.

Western Australia is the second driest State in the world's driest continent. A major drinking water source for the city of Perth is from groundwater in the Gngangara

Mound, which is a shallow sand aquifer over an impermeable clay. There are four fields of shallow wells, with two additional well fields planned. Many decades ago a pine plantation was planted on the Gngangara Mound groundwater recharge and well field area for the city of Perth. These trees have grown to a substantial height. **As a result, the water table and amount of water available for pumping has progressively decreased due to the high evapotranspiration rates associated with the increasing canopy area of the trees.** Thus, a plan has been developed by the Waters and Rivers Commission for staged harvesting of the pine trees and to plant these areas to a vegetative cover of primarily perennial grasses that will function as a park, as well as functioning in reducing the evapotranspiration rate and increasing the amount of groundwater available for pumping to provide vital drinking water for the city of Perth. This is an excellent "real-world" example that turfgrasses are a relatively low water user compared to trees, and are in fact a water conservation vegetation. Research in the United States provides clear data confirming the experience of the city of Perth.

- **No valid basis exists for water conservation legislation that requires the extensive use of trees in place of turfs.** The proper strategy is to select low water use turfgrasses and trees for moderate to low irrigated landscapes and to select drought resistant turfgrasses and trees for nonirrigated areas.
- **Numerous "low water use plant lists" have created much confusion. Frequently, uninformed authors have incorrectly assumed those plants surviving in arid regions also have low evapotranspiration rates.** Actually, the physiological mechanisms controlling evapotranspiration and drought resistance are distinctly different and in no way are they directly correlated among plant species.


### China Discovers the Benefits of Turfgrasses

During the communist Red purges that occurred throughout China many decades ago, one of the dictates to eliminate capitalist's symbols from the country was to remove green lawns and even cut down ornamental trees. Subsequently, many of China's outdoor public open spaces

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## Disease Alert

A root rot fungus is causing extensive damage on St. Augustinegrass (*Stenotaphrum secundatum*) according to Dr. Phil Colbaugh of the Texas Agricultural Experiment Station in Dallas. The damage to St. Augustinegrass lawns extends from Texas eastward along the Gulf Coast. Recent diagnoses also have been made in Arizona and California. The disease is caused by *Gaeumannomyces graminis* var. *graminis*, with the initial symptoms being a yellowish chlorosis of

the leaves and a root system that is basically dead. The lawns typically thin and eventually the turf may die in large irregular patches. Dr. Colbaugh is finding that good control can be obtained for this root rot problem by a combination spray of thiophanate-ethyl (Cleary's 3336®) plus mancozeb (FORE®) at a 4 ounce (113 g) rate. The use of TeeJet 8004 nozzles to increase the spray volume to 2 to 4 gallons (7.6–15.1 L) of spray has proven beneficial. 

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have been maintained as well-swept dirt ground. The soil had become severely compacted and many areas were groomed each morning by a large number of broom-wielding workers.

More than 15 years ago I was contacted by Chinese government officials concerned with the development of a revegetation plan for urban open spaces, such as the city of Beijing. The elimination of green vegetative covers that stabilize the soil had resulted in a major increase in atmospheric pollution within the city in the form of flying dust and even dust storms that reduced visibility. **More importantly, the increases in a number of serious human diseases were occurring at a much greater rate than in any other major non-Chinese city in the world.** Their interpretation was that the lack of green vegetative cover and its associated living biological ecosystem of antagonists to the disease-causing bacterial and viral organisms had resulted in a major increase in disease causing organisms which were readily disseminated by the windblown dust particles. Similar problems were occurring in many other large cities in China.

Unfortunately, I never was given the opportunity to review the actual documents on which these conclusions were drawn.

In an attempt to eliminate these serious urban pollution and human health problems, the Chinese governments in these major urban centers have embarked on a major program to revegetate the open spaces by planting turfgrasses in parks, on sports-recreation areas, along roadsides, and around major government facilities. Even the famous Tiananmen Square now has distinct turfed lawn areas.

- This series of historical events ranging between the extremes of bare dirt versus the use of turfgrass emphasizes the important values of turfgrasses not only from an aesthetic standpoint, but also from the beneficial effects in reducing air pollution, protecting human health, and enhancing the quality-of-life in densely populated urban areas.
- This experience also emphasizes the impact that the presence of turfgrasses have on the environment and on the human population. 

## Turfgrass Root Basics

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- **Thatch**—cultural practices should be adjusted to avoid an excessive thatch accumulation of dead organic matter. An excessive thatch causes the roots to remain in the thatch layer rather than growing into the underlying soil root zone; thus, resulting in increased proneness to disease, insect, drought, heat, and cold stresses.
- **Preemergence herbicides**—a number of preemergence herbicides exhibit varying degrees of toxicity to turfgrass roots, even though there are no direct visible ef-

fects to the aboveground shoots. Thus, such preemergence herbicides should only be used as needed to correct a serious developing weed problem.

- **Insects, nematodes, and diseases**—wherever there is a developing pest problem that may cause extensive loss of the root system and allied turf, it is important to implement the appropriate pesticide application that is targeted specifically for the individual problem. 