

Irrigation Of Landscape Plants

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Moisture deficiency is the most common plant stress encountered in the landscape. Usually, this is a temporary condition and has minimal impact on plants. Periodically, however, drought conditions may persist for several months or years and can significantly affect plant health and survival (Figure 1). Over-irrigation of landscapes is a significant problem as well, often causing as much harm to plant health as drought.

Effects of Improper Irrigation

From the regulation of leaf stomata to the reduction in growth, moisture stress adversely affects virtually every physiological process in the plant. Ultimately, the adverse effects on these processes result in reduced photosynthesis, which limits growth and increases susceptibility to insect and disease pests. For more detailed information on the physiology of drought stress, see the Bartlett Tree Research Laboratories Technical Report “*Drought and Landscape Plants.*”

In order to prevent these stresses, many landscapes are now irrigated, but irrigation may be more detrimental to some species if water is not properly managed.

Figure 1: Long-term drought eventually leads to branch dieback and tree decline



Over-irrigation is a chronic problem in landscapes and can result in similar stresses to the plants as drought. In many cases, irrigation systems are simply set on a schedule and never adjusted for weather or plant needs. This is not only potentially detrimental to the plant, but also the environment.

Drought and Irrigation Management

Drought Resistant Plants

Utilizing drought resistant plants in the landscape, especially in low maintenance areas, is an effective method of minimizing the effects of drought. These selections also reduce the amount of water used to maintain their health. Often, these species are watered more than necessary since conventional wisdom implies that more water is better. In regions with a true dry season, native or drought-adapted species should not be irrigated unless they are newly planted, have suffered root damage or have limited soil volume. These species should not be irrigated the same as species that have higher water requirements.

Irrigation

Most landscape plants require one inch of water per week during the growing season unless drought-adapted species are established. This volume is equivalent to approximately 625 gallons of water per 1000 square feet beneath the crown. On established

plantings in clay or loam soils, the recommended quantity of water should be supplied at least once each week. For new transplants, root damaged trees or plants growing in sandy soil, water should be provided

Figure 2: Overhead irrigation is convenient, but can be inefficient and may lead to overwatering



at least twice a week. Water should be concentrated on the root ball and immediately surrounding soil of new plantings. Overhead or sprinkler irrigation is very common and can be effective for watering large areas of soil. However, care must be taken to use these systems properly to reduce water usage and promote plant health (Figure 2). It is important to direct water away from direct contact with the trunk and leaves of trees and shrubs as this can lead to increased disease incidence and decline. All too often, these systems are overused or scheduled improperly and create saturated soil conditions or runoff. The misuse of irrigation can often be as harmful as drought stress.

Drip irrigation systems or soaker hoses usually are most efficient since they irrigate only the root zone and minimize runoff and evaporative loss. These systems deliver water slowly to the soil, so attention must be paid to ensure that these low-volume systems are being run long enough to deliver appropriate quantities of water. Tensiometers are effective tools for assessing irrigation needs. Consult Bartlett Tree Research Laboratories Technical Report “*Tensiometers in Landscape Plantings*” for information on use.

Regardless of irrigation type, species water requirements must be matched with irrigation and landscape design so that species requiring large volumes of water are not irrigated the same as species that do not perform well in wet soils. If these factors are not considered, plantings will often decline.

Cultural Practices

Many cultural practices should be used to preserve soil moisture and reduce the reliance on irrigation. Adding a 2-4” deep organic mulch layer to the soil surface will reduce evaporation from the soil and also eliminate competition for water and nutrients from turf and other competing plants.

Proper fertilization by prescription will reduce nutrient stress on the plant and may help minimize the effects of drought. Pruning dead and dying limbs to remove potential insect and disease pests should be performed. Light thinning of dense crowns may reduce water demands; however significant pruning should be avoided as this may add additional stress.

Close attention should be paid to insect and disease pest populations as these pests may impede absorption and translocation of water and nutrients. Pests should be managed using integrated pest management (IPM) principles, a technique of periodically inspecting plants for pests and other plant health problems.

Summary

Moisture stress from drought periodically affects landscape plants. Irrigation to prevent drought stress must be properly designed and managed to avoid additional stress and promote a healthy landscape.



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