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# MANGEMENT TIPS TO IMPROVE TURFGRASS DROUGHT SURVIVAL

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When rainfall is insufficient and water resources become limited, supplemental irrigation is often required to sustain turf growth. Under rainfall deficit conditions, irrigation of landscape plantings such as turf is often among the first activities to be placed on water use restrictions. Under such restrictions professional turfgrass managers and homeowners are required to maintain functional and high quality turf with less water.

Water conservation strategies are routinely practiced in the semi-arid and arid regions such as the desert southwest. These strategies include (i) incorporating water use efficient plant material into the landscape, (ii) implementing water conserving management practices, and (iii) maximizing irrigation efficiency by controlling leaching, pooling or ponding of irrigation water, and surface water runoff.

## **Management Tips to Improve Turfgrass Drought Survival:**

### **1. Mowing and Nutrition**

Mow at the high end of a species (and cultivars) recommended mowing height range (2 to 3 inches) to encourage shading of the soil surface, deeper rooting and drought survival. Apply nitrogen judiciously, low to moderate levels of fertilizer nitrogen (with at least 30% slow-release nitrogen) are preferred. Fertilization should be avoided on non-irrigated turf during drought. Avoid excessive levels of nitrogen that encourage rapid shoot growth rates (and water use rates), succulent tissues (which are more drought sensitive), and to avoid nitrogen-induced reductions in rooting depth and numbers. A moderate green color is healthier and preferred to dark green color. In the fall ensure adequate phosphorus and potassium levels (based on soil test) to encourage drought recovery. Where no potassium deficiency is indicated, potassium levels should be approximately 50 to 75% of the nitrogen applied.

### **2. Water Intelligently**

Apply water only as fast as it can enter the soil surface to avoid surface runoff and puddling, apply only as much that can be reasonably stored in the root zone to avoid leaching. Water to the depth of the root zone! Inspect the soil for rooting depth by any means available (garden trowel, shovel, soil probe). Most turfgrass species require 1 to 1.5 inches of water per week. For low traffic sites where wear tolerance is not critical, schedule irrigation events to allow for mild to moderate stress (wilting indicated by leaf roll/fold symptoms) to occur between irrigation events to maximize rooting and drought survival. Avoid excessive irrigation that encourages succulent tissues, depletion of soil oxygen important for root activity, and to avoid soggy conditions that can intensify soil compaction. In the fall, control conditions that reduce soil infiltration rates such as soil compaction, thatch, and hydrophobic soils that reduce irrigation efficiency.

### 3. Control Root Related Stresses in the Spring and Fall

- **Soil pH** - maintain pH between 6.0 and 7.0 because root growth and root activity is limited below pH 5.5 and above pH 7.5.
- **Compaction** - manage compaction to maximize rooting potential by maintaining optimum aeration (soil oxygen content), gas exchange (to limit toxic CO<sub>2</sub> levels), and to minimize water logging and prolong soil wetness.
- **Apply Herbicides Intelligently** - preemergence herbicides are more toxic to roots than to shoots (hence: turfgrass shoots may be unaffected while root activity is severely reduced). A herbicide should be applied only as needed and according to label directions. Spot treat for broadleaf weeds when possible to limit stress and avoid blanket applications when air temperatures exceed 85 degrees F.
- **Thatch** - manage thatch to keep levels below 1/2 inch in order to promote deeper rooting into the soil and to limit rooting that is confined to the thatch. Thatch generally has poor nutrient and water holding characteristics.

#### **Brown/Straw Colored (Dormant) Lawn -Turf Strategies:**

Under prolonged periods (2 to 4 weeks) of little or no water (precipitation, irrigation) grasses will cease to grow and shoots and root will die back, resulting in a straw-colored turf. However, perennial parts of the plant including crown tissues (located near or at the soil surface) and nodes located on lateral stems (rhizomes and stolons) are still active and capable of regenerating new shoots and roots at the first significant rainfall. Recovery and green-up from normal summer dormancy with rain and cooler weather may take 2 weeks or more before 100% green-up is obtained. Following extended periods of dormancy (45 to 60+ days) with little or no rainfall, only 70% recovery may be possible. If a high quality and functional turf is your goal, drought induced dormancy can be avoided by timely watering and proper management as previously outlined.

#### **Additional Strategies for Dormant Turf:**

- **Mowing** – don't mow unless absolutely necessary to reduce stress; mow high and infrequently; avoid mowing mid-day, late afternoon and early morning are preferred; use a sharp mower!
- **Fertilization** - consider a drought fertilization program in the fall to enhance recovery; superior root and stem development (rhizome and stolon) is critical for recovery and low nitrogen and high potassium rates are helpful (i.e., 15-0-30 type or similar analysis); avoid straight nitrogen applications.
- **Irrigation** - if irrigation cannot be applied properly and on a timely basis it is preferred to allow the turf to enter dormancy (buds associated with crowns and lateral stems are extremely drought hardy); unirrigated turf in a dormant state produces a healthy turf in a short time after drought ceases; inadequate watering during drought-induced dormancy accelerates depletion of carbohydrate reserves which reduces drought-recovery potential.

- **Pest Problems** - inspect for disease (summer patch) and insects (chinch bugs) on a regular basis which may go undetected when the turf is dormant and not actively growing; weed pressure and numbers may increase which compete for limited soil moisture, reduce herbicide usage (spot treat for weeds) during dormant periods.
- **Renovations** - consider renovations in the fall if drought-recovery is poor or thatch levels are excessive (1.0 inch).

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