

Environmental Stresses and Your Florida Lawn¹

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Florida lawns are subject to many environmental stresses. These can include nutrient deficiency, salinity and cold temperatures, as well as prolonged exposure to shade, drought or traffic.

Environmental stress can best be managed in two ways. A first step is selecting the most stress-tolerant species or cultivar for a given region of the state. (See EDIS Publication ENH04, *Selecting a Turfgrass for Florida Lawns*, <http://edis.ifas.ufl.edu/LH005>.) The use of proper cultural and management practices will also help keep your lawn healthy, sometimes even despite environmental stress. Rely on the recommendations made by the University of Florida Institute of Food and Agricultural Sciences (UF/IFAS) for lawn fertility, irrigation, and mowing. (See *The Florida Lawn Handbook*, available online -- <http://edis.ifas.ufl.edu/features/handbooks/floridalawn.html> -- and at The IFAS Extension Bookstore -- <http://ifasbooks.ufl.edu/merchant2/>.)

Carbohydrates and Stress

Carbohydrates accumulate in a plant through the process of photosynthesis. Photosynthesis allows plants to convert sunlight into energy. This energy is

either immediately used by the plant or stored for future use. An ample supply of energy stored in the grass plant as carbohydrates will help a lawn to grow and remain healthy. Carbohydrates are also vital in your lawns recovery from stress.

The following practices can help a lawn to maintain sufficient stores of carbohydrates:

1. Fertilize appropriately.

When nitrogen is applied in excess of recommended amounts, the resulting growth surge consumes much of the grass' stored carbohydrates. As a result, less reserve carbohydrate material is available in the grass to help it cope with stress, so the turf has a harder time recovering from stress.

If excess fertilizer is applied late in the growing season, especially in any part of Florida where the grass is dormant over the winter – such as sometimes occurs in North Florida (north of Ocala) and, less often, in Central Florida (south of Ocala to Vero Beach on the East Coast or Tampa on the West Coast -- spring growth can be delayed or reduced. Turf density will also decrease in such cases, giving weeds a greater chance to invade.

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2. Mow at highest possible height.

All landscape grasses should be maintained at the highest mowing heights for that species and cultivar. The higher the grass, the deeper the roots. Deep roots increase a grass' chances of surviving stresses. Mowing below the recommended height reduces the grass' ability to photosynthesize and forces the grass to put energy reserves into regrowth. (For more information on mowing heights for various turfgrasses, see EDIS Publication ENH10, *Mowing Your Florida Lawn*, <http://edis.ifas.ufl.edu/LH028>.)

3. Reduce environmental stresses.

As much as possible, protect your lawn from stress.

- Irrigate and fertilize according to UF guidelines. (See EDIS Publication ENH860, *Fertilization and Irrigation Needs for Florida Lawns and Landscapes*, <http://edis.ifas.ufl.edu/EP110>, and EDIS Publication SP-045, *Florida Lawn Handbook: Best Management Practices for Your Home Lawn in Florida*, 3rd ed., 2005, http://edis.ifas.ufl.edu/VQRKaDQQMaHmktfcaLawn_Handbook_3rd_ef0.)
- Avoid excessive or repeated traffic over the turf, whether the traffic is from humans or vehicles. (See EDIS Publication ENH152, *Minimizing Traffic Damage to Your Florida Lawn*, <http://edis.ifas.ufl.edu/EP071>.)
- Reduce shade if possible or grow ground-cover plants that are more appropriate than turfgrass for areas of heavy shade. (For more information on growing turfgrass in the shade, see EDIS Publication ENH151, *Growing Turfgrass in the Shade*, <http://edis.ifas.ufl.edu/ep072>; and EDIS Publication ENH967, *St. Augustinegrass – Made for the Florida Shade*, <http://edis.ifas.ufl.edu/ep226>. For more information about ground cover plants, see EDIS Publication ENH 30, *Ground Covers for Florida Homes*, <http://edis.ifas.ufl.edu/EP016>.)

The Root System

Maximum root growth enhances a lawn's ability to tolerate stress. A deep, vigorous root system is better able to reach adequate water and nutrients, even when the soil is dry. Grass with maximum root growth will maintain a larger supply of carbohydrates to help with recovery from stress. To help your lawn achieve maximum root growth, use the following management practices:

1. Fertilize appropriately.

Moderating nitrogen fertility is vital to maintaining a healthy lawn. As stated above, excess nitrogen can reduce tolerance to many stresses. Excess nitrogen will make the leaf blades (grass shoots) grow faster than the roots, reducing the grass's capability for nutrient uptake.

2. Mow at highest possible height.

As mentioned above, mowing too low removes a large portion of the leaf blades available for photosynthesis. After a lawn has been mown too low (“scalped”), it will regrow leaf blades instead of the root system.

3. Irrigate properly.

Irrigating on an “as-needed” basis will encourage turf roots to grow deep into the soil. Deep roots are better able than shallow roots to find water and nutrients even when the soil is dry. This capacity increases grass health and tolerance for stress, so irrigate less frequently. Daily irrigation will keep roots in only the upper few inches of soil. For more information on proper irrigation, refer to the Your Florida Lawn Web site -- <http://yourfloridalawn.ifas.ufl.edu>.

Other Nutrients: Potassium and Phosphorus

Other nutrients also influence stress tolerance in lawns. Potassium (K) has been shown to alleviate stress, including the effects of cold temperatures, drought, and traffic. An autumn application of K on your lawn will encourage earlier and faster spring green-up. Application of 1/2 to 1 pound of K per

1,000 square feet with each fertilizer application is sufficient to provide these stress-tolerance benefits.

Phosphorus (P) can aid and quicken root growth for a lawn, especially a newly established lawn. In Florida, however, a state rule that became effective Dec 31, 2007, sets maximum rates for application of P to lawns. The rule -- designed to protect water quality in Florida -- limits individual applications on lawns to 1/4 pound P per 1,000 square feet. The rule also limits to no more than 1/2 pound P per 1,000 square feet the total P that can be lawfully applied annually on a lawn. During the establishment of a lawn, however, the rule allows a one-time application of up to 1 pound of P per 1,000 square feet .

To lawfully apply P to a lawn in Florida in amounts beyond what this state rule allows, a soil test or tissue test showing a deficiency of this element is necessary. (For more information about testing soil, see EDIS Publication CIR1248, *UF/IFAS Extension Soil Testing Laboratory Analytical Procedures and Training Manual*, <http://edis.ifas.ufl.edu/SS312>. For more information on the state's Urban Turf Fertilizer Rule, see the fact sheet on this topic published in 2007 by the Florida Department of Agriculture and Consumer Services (http://www.flaes.org/pdf/Urban_turf_fact_sheet.pdf).

A Healthy Lawn is a Hardy Lawn

To maintain a healthy lawn -- which can better withstand drought, traffic and cold temperatures and better resist invasion by weeds, insects and diseases -- follow the guidelines found on the Your Florida Lawn Web site -- <http://yourfloridalawn.ifas.ufl.edu> -- and in *The Florida Lawn Handbook*, <http://edis.ifas.ufl.edu/features/handbooks/floridalawn.html>. (And for detailed information on caring for your lawn during drought, see EDIS Publication ENH157, *Managing Your Florida Lawn under Drought Conditions*, <http://edis.ifas.ufl.edu/EP078>.)

A healthy lawn is not only attractive; a healthy lawn also requires fewer applications of herbicides, insecticides, and fungicides. That important difference will benefit you, your family and pets, and the environment.