Growing Turfgrass in the Shade

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It is often easy to overlook site specifics when troubleshooting problems in the lawn. Sometimes we don’t think past problems like insects or disease, but conditions such as amount of shade can be an important factor in how a lawn holds up over time. Homeowners are not often aware of the problems associated with shade either and may point to disease or weed problems caused by excess shade as being a pest management problem. There can also be emotion involved and reluctance to remove or trim up trees to allow enough light in for grass growth.

So how much light is actually needed by lawngrases for good growth and health? The amount varies by species and, in some cases, by cultivar within species. The amount of shade present in a landscape varies over time as trees mature and can also vary seasonally. Sunlight also varies within a yard, so portions of a lawn may be in full sunlight all or most of the time, while other portions may be shaded throughout part or most of the day. Grass that does not receive enough sunlight has long, spindly leaf blades and stems because it is working hard to obtain sunlight. This tissue elongation depletes the plant's carbohydrates, which can reduce the lawn's overall health and vigor. Other shade tolerant groundcovers or mulch should be used on sites where there is insufficient sun.

A plant's light needs can be described in terms of both hours of sunlight and percent of full sun. Most of Florida's grasses should receive at least six hours of sunlight each day for optimal turfgrass growth and health. Some of this light may be partially filtered by trees. Research has shown that most St. Augustinegrass cultivars actually grow best if up to 30% of full sunlight is filtered throughout the day. Grass growing in some shade has less heat and drought stress and maintains a darker green color than grass growing in continual full sunlight.

In areas that receive moderate amounts of shade, certain species and cultivars of grass persist, while other less shade-tolerant species may not perform well over time. In these areas, choice of the right turfgrass species is important. It is also important to follow specific management practices that can encourage better turfgrass performance in shade.

Species Suitable for Use in Shade

St. Augustinegrass has the best tolerance for shade of any of the warm-season grass species and also grows well in full sunlight. The most shade-tolerant cultivars are 'Seville', 'Delmar', and 'Captiva', all of which can sustain with five to six hours of sunlight. 'Floratam', which is the most widely used St. Augustinegrass cultivar, has relatively poor shade tolerance and requires a minimum of six to preferably at least eight hours of sunlight daily.

Zoysiagrass cultivars such as 'Empire' have moderate shade tolerance, performing best with six to eight hours of sunlight per day.
Centipedegrass tolerates moderate shade. Bahiagrass, seashore paspalum, and bermudagrass are sun-loving species that do not do well in shaded conditions.

Research on shade tolerance of various St. Augustinegrass cultivars was conducted under greenhouse conditions at the University of Florida Turfgrass Research Envirotron in Gainesville. Five St. Augustinegrass cultivars (Bitterblue, Floratam, Palmetto, Seville, and Floraverde) were subjected to 4 different light regimes (0, 30, 50, and 70% shade). Grasses were grown in 6-inch pots placed under PVC-frame shade structures fitted with shade cloth to provide 30, 50, or 70% shade (Figure 1). Evaluations were made over two 7-month periods for physiological and morphological responses to light levels. Measured responses included visual quality, color, and density of grasses, shoot and root growth, leaf chlorophyll concentration, leaf morphology (length and width of leaf blades), leaf area index, concentration of stored carbohydrates, and photosynthetic activity.

Figure 1.

Shade research in the Envirotron greenhouse. Foreground are full sun treatments, left rear is 30% shade treatment. Right rear is 70% shade treatment.

Results

Quality scores differed significantly between cultivars at different shade levels when averaged over the trial period (Figure 2). At 30% and 50% shade, Seville and Floraverde both ranked in the highest statistical category for quality. At 70% shade, all cultivars had significantly reduced quality, with lowest quality in Floratam. Using a ranking of 6 as minimally acceptable turf quality, Floratam quality fell below acceptable levels at 52% shade, Palmetto and Floraverde at 64 and 65%, respectively, while Seville and Bitterblue maintained quality at acceptable levels up to 70% shade.

Figure 2.
Average quality scores of different St. Augustinegrass cultivars at increasing shade levels. A score of 6 is considered minimally acceptable.

Maximum quality levels were reached at slightly different shade levels, ranging from 16% shade for Palmetto to 22% shade for Floratam. Quality ratings then declined as shade increased from these levels. Most turfgrasses are well adapted to low levels of shade, which is logical when you consider that the plant is subjected to less heat and drought stress than if it were growing in full sunlight.

Leaves grow significantly longer under shade (Figure 3). The grasses in the figure below were all last mowed at the same time. Differences in height are directly related to effects of shade on leaf extension.

Figure 3.
Grasses after 3 months of treatments. From left to right: 0, 30, 50, 70% shade.

Management Practices for Growing Turfgrass in the Shade

This research demonstrates what can happen to lawns due to effects of shading over time. It is therefore very important to follow specific management protocols to maintain healthy turf in a shaded environment. You may or may not have control over all of these practices (mowing, irrigation) but leave a copy of this article with clients so that they can follow the recommendations.

- **Increase the mowing height.**

Mow grass at the highest recommended height for the species. The increased mowing height allows for more leaf area. The more leaf area, the more light the grass can absorb. Higher mowing heights promote deeper rooting, which is one of the key mechanisms of stress (shade) management. For standard St. Augustinegrass cultivars (Floratam, BitterBlue, Classic, etc) this is 3.5 to 4 inches. For dwarf cultivars, it is 2 to 2.5 inches. For zoysiagrass cultivars such as Empire, mow at 2 to 2.5 inches.

- **Reduce fertilizer applications.**

Grass grows more slowly in a shaded environment and needs less fertilizer. Too much nitrogen fertilizer depletes carbohydrates and produces a weaker turf system. Use a slow-
release nitrogen fertilizer to minimize growth and look for a fertilizer that has equal (or close to equal) amounts of nitrogen to potassium. Recent research has indicated that higher levels of potassium may help the grass sustain better under shaded conditions.

- **Irrigate shaded grass less than grass growing in full sun.**

Turf growing in the shade needs less water than that growing in full sun. If an irrigation zone covers an area that is partially shaded and partially sunny, consider removing the sprinkler heads from the shaded areas and irrigating by hand in those areas. Watering shaded grass on the same schedule as grass in full sun can increase disease presence because of greater soil moisture, increased humidity, and reduced air circulation. Monitor closely for disease in shaded conditions.

- **Avoid heavy traffic.**

Grass growing in shade is more easily injured by traffic and may recover from damage slowly. Please refer to *Minimizing Traffic Damage to Your Florida Lawn* ([http://edis.ifas.ufl.edu/EP071](http://edis.ifas.ufl.edu/EP071)) for more information.

- **Monitor for weeds.**

Weeds are able to invade turf under stressful conditions. In a shaded environment, the ground area covered by the grass is reduced, leaving bare ground that is vulnerable to weeds. Treatment with a pre- or postemergence herbicide may be necessary. Indicator weeds such as dollarweed and sedges often indicate overwatering. To successfully control these weeds, it takes a combination of herbicides and a change in the amount of applied water. For more information on weed control in the home lawn, please refer to *Weed Management in Home Lawns* ([http://edis.ifas.ufl.edu/ep141](http://edis.ifas.ufl.edu/ep141)).

**Watch for Competition from Trees**

Grasses growing under trees are subject to more than just shade stress. These grasses must compete with tree roots for soil space, water, oxygen, and nutrients. Tree roots may extend far from the canopy line (beyond the tree's actual branches and leaves), so these competitive effects can also occur at some distance from the tree. In some cases, removal of trees or trimming of lower branches may be necessary for continued grass growth.

**Conclusion**

Growing some species and cultivars in partial shade is certainly possible. Most warm-season grasses perform well as long as they receive six to eight hours of sun each day. If a lawn site receives less than this, look for a dwarf St. Augustinegrass cultivar, such as 'Delmar', 'Seville', or 'Captivea'. St. Augustinegrass can generally perform well with mild filtering of sunlight, but shade should not exceed about 30% for best performance. Follow the management strategies outlined here to enhance lawn growth optimize grass health under shaded conditions.