St. Augustinegrass: Shade Tolerant, But How Much?

By Phil Busey

In warm climates, St. Augustinegrass is generally the best choice for shady landscapes, but it's not without problems.

There are shade-tolerant varieties of St. Augustinegrass, such as Seville and Palmetto, however the variety Floratam grows poorly in shade (see Table 1).

The bigger problem is whether any St. Augustinegrasses can survive "this much shade," which will require answering the even more difficult question, "How shady is it?" St. Augustinegrasses can grow in 25% relative light, where 100% represents an open area. Dwarf varieties can sometimes survive in 12% relative light, but not much less. Floratam thins out even at 20% relative light, its leaves grow tall, and are scalped by mowing.

Measuring shade the hard way

Shade, the reduction of light, is difficult to measure. Tree shade moves throughout the day with changing sun angle (see illustration on page 47). Light meter readings can be made at multiple points around a tree, and mapped, to show the area impacted by shade at the instant of measurement. (Technically it is photosynthetic photon flux density, and not visible light, that affects plants the most. But to get even a rough approximation of shade measurement, I must simplify.)

Repeated measurements throughout the day, recorded and summed for each point, can be superimposed to show a map of concentric circular areas of different levels of cumulative light. Compared with adjacent nonshadowed areas, with 100% of available sunlight, as we walk toward the trunk, there is a circular area with only about 12-20% relative daily light. That's where grass stops growing and there is only bare soil. This method is accurate and time-consuming.

It is simpler to visually estimate relative light. For example, when asked to describe shadiness, some people say, "The lawn receives three hours of sunlight." Although a rough estimate, it has value. Assuming a 12-hour day with uniform light, three hours of sunlight is approximately 25% relative light. But the guesstimate of shade level does not factor in how tree shade varies by tree species. Trees with open canopies, such as slash pine, cast lighter shade compared with dense canopy trees such as live oak, which are generally too dark to allow any grass survival.

Is there any method for shade measurement that is more accurate than guesstimation of shade hours? And less time consuming than making measurements all day? Yes.

Performance of St. Augustinegrass varieties in shade, 17% relative illumination under trees

TABLE 1: ST. AUGUSTINEGRASS IN SHADE

VARIETY	TURFGRASS QUALITY (10 = best, 7 = acceptable)	GROWTH HABIT
Delmar	6.8	Dwarf
Seville	6.0	Dwarf
Jade	5.3	Dwarf
Bitterblue	4.3	Non-dwarf
Raleigh	4.0	Non-dwarf
Floralawn	2.8	Non-dwarf
Floratam	2.3	Non-dwarf

The overcast sky method

To easily and accurately measure shade, you need nothing more than a good camera, a piece of cardboard, and an overcast sky.

Under an overcast sky there are no shadows and no problems from sun angle. The overcast sky emits dullish light from all angles throughout the day, proportional to percent sky exposure. An open area with no trees has 100% exposure to the overcast sky. If there is 50% sky exposure under the tree, the light under the tree is 50% as much as in the open area. This method accounts for canopy filtering (e.g., slash pines vs. live oaks), beats guessing, and beats making measurements all day. (For scientific proof of the accuracy of light measurements under an overcast sky, see Campbell and Marini, 1992.)

A large surface of medium color such as a piece of cardboard is a reference target. The cardboard is placed on the ground under the tree and a camera reading is taken, then the cardboard is moved to the open area away from the tree, and a second reading taken.

Although most of us use a camera on fully automatic setting, a good camera has a manual setting which provides a readout of the aperture or exposure time or deviation (in F-stops) from ideal exposure. Since F-stops measure light in powers of 2 x (or 0.5 x), an area under a tree with 1 F-stop difference from full sun has 50% relative light, while 2 F-stops represents 25% relative light. If the readout is in exposure steps (e.g., 1/15 or 1/30 seconds) or in aperture stops (e.g., 4.0, 5.6) these are also powers of 2.

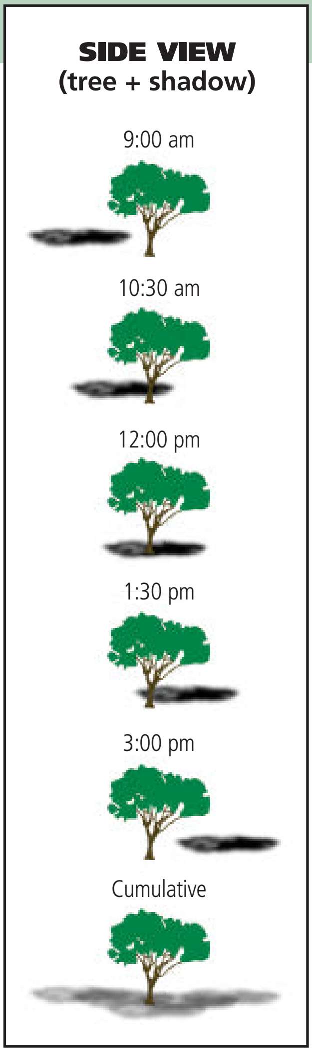

ILLUSTRATION COURTESY: PHILIP BUSEY

Testing in the shade

Scientists standardize shade level, under fabrics of known percentage transmission, to compare turfgrasses growing side-by-side in shade.

Neutral fabrics, such as black shade cloth, filter sunlight uniformly across the entire sky, without the problems of sun flecks or sun angle. Neutral shade is not perfect in representing the quality of light, the proportion of photosynthetic photon flux density largely in the red wavelengths, but it provides a reasonably accurate way of forcing relative shade levels of known percentages.

Few shade tolerance studies have been done of St. Augustinegrass varieties, and they generally use more light than is the problem.

To detect differences in shade tolerance among St. Augustinegrass varieties, shade tolerance studies should be conducted in the range of 10-20% light, not 25-45%, as has been the case.

Getting shade grass

The last problem in the use of shade tolerant St. Augustinegrasses is where to obtain them. If they are not readily available, contact information for sod producers who grow shade tolerant St. Augustingrass varieties can be obtained from statewide listings such as www.floridasodgrowers.com. You can then call the grower and ask for the names of landscapers and installers they deal with.

Even with the overcast sky method of shade measurement, remember common sense; trees with touching canopies, or trees with a canopy touching a building are serious problems. So are dense shade species such as live oak, citrus, and Cuban laurel fig under which usually no turfgrass will survive.

As shown in the initial question, appropriate pruning may help temporarily. Deciduous trees such as cypress and gumbo limbo, and trees with filtered shade such as slash pine, may allow turfgrass to survive.

In summary, to deal with the problems of shade, the first step is determining the shade level, then be reasonable and don't expect miracles. Why we have not made more progress with shade tolerant St. Augustinegrasses, besides the difficulty of measuring shade, is the fact that university shade tests are not shady enough.

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