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COMPARATIVE PERFORMANCE OF FOUR CULTIVARS OF TURFGRASSES IN SOUTH FLORIDA

DAVID E. WEDGE
Department of Biological Science
Florida Atlantic University
Boca Raton, FL 33431-0991

Abstract. **Homeowners and local regional governments in Florida desire low maintenance ground covers. Therefore four xerophytic turfgrasses were evaluated for persistence. Turfgrasses were established since late July 1990 along an access road to a public park and Interstate 95 in West Palm Beach, Florida. Percent cover was determined after eight months for commercial Argentine Bahiagrass (*Paspalum notatum*) and three experimental grasses: Bahiagrass cv. 'Rapid Cover Polycross' (RCP-2) (*Paspalum notatum*); St. Augustinegrass cv. FX-10 (*Stenotaphyrum secundatum*); and Buffalograss cv. 'Prairie' (*Buchloe dactyloides*). Eighty replicates in four plots using a rapid establishment method preceded the preliminary data. Argentine Bahiagrass and St. Augustinegrass cv. FX-10 were the good performers while Buffalograss cv, 'Prairie' and RCP-2 were poor performers.**

One of the most useful measurements of plant populations is cover (Smith, 1966). Coverage is best expressed as basal area, the ground actually covered by the grass plant. In range and grassland ecology, the basal area refers to the area at the height at which the grass is normally utilized. This height is usually 25 mm for sod grassed and 75 to 125 mm for bunch grasses. Percentage of cover combines three major determinants of turfgrass visual quality: density, texture, and uniformity (Turgeon, 1985).

The area of coverage may be used to express dominance of one plant over another, such as other grasses or weeds. Hence, in this experiment, I used coverage to relate dominance or lack of it in relation to weed intrusion or gaps in the turf cover. Coverage is usually obtained by estimating the area covered by each grass species projected on the ground (Smith, 1966).

Materials and Methods

The turfgrass research area was located adjacent to Interstate 95 and a service road to Dreher Park in West Palm Beach. Installation of four turfgrasses began July 21, 1990 and was completed July 29, 1990. Four different turfgrasses were planted in a split plot design with each species replicated five times per block, with a new randomization for each block. Initially turfgrasses were pushed heavily for growth with 1.5 lbs of nitrogen/1000 sq. ft. and daily irrigation rates. In November 1990 I lowered the fertility rate to 0.75 lbs/1000 sq. ft. and decreased irrigation to 30 minutes three times per week. January 1991, irrigation rates were again decreased to 20 minutes twice per week and fertilizer was applied at 0.75 lbs/1000 sq. ft. every other month. Thus, turfgrass were allowed to grow naturally with decreasing water and fertility rates for eight months from the time of installation until late March.

The four xerophytic turfgrasses used in this study are:

1) Argentine bahiagrass (*Paspalum notatum* Flugge) was used as the control because it is the standard grass plant used along road sides by the Florida Department of Transportation.

2) St. Augustinegrass (*Stenotaphrum secundatum* [Walt.] Kuntze.) cv. FX-10 developed by Dr. Philip Busey, University of Florida, is a cross between an African type St. Augustine and Floritam. This germplasm is highly chinch bug resistant and requires significantly less water than commercially available Floritam. FX-10 also has a less frequent mowing requirement.

3) Bahiagrass (*Paspalum notatum* Flugge) cv. RCP-2 (Rapid Coverage Polycross) - also developed by Dr. Philip Busey, University of Florida, is a bahia type that has very rapid spread from seed, hence its name.

4) Buffalograss (*Buchloe dactyloides* [Nutt.] Engelm.) cv. "Prairie" - developed by Dr. Milt Egelkey, Texas A & M University. *Buchloe dactyloides* is a native prairiegrss of the central United States. This selection has performed satisfactorily in Texas under irrigation rates of 17-70 inches per year. This grass has never before been scientifically evaluated in Florida and is of interest due to its tolerance of high pH, shell rock intruded soils.

Percentage turfgrass cover was determined by using a one meter quadrat which was divided every 10 decimeters by colored cross wires into 100 decimeter squares. Five central squares were delineated on the quadrat and each of the count squares were subdivided into four 10 decimeter sections which allowed me to quantify the percent cover. By determining percent cover for these five squares on a quadrat (Fig. 1), I was able to estimate percent cover over a square meter. These five sampling squares repre-

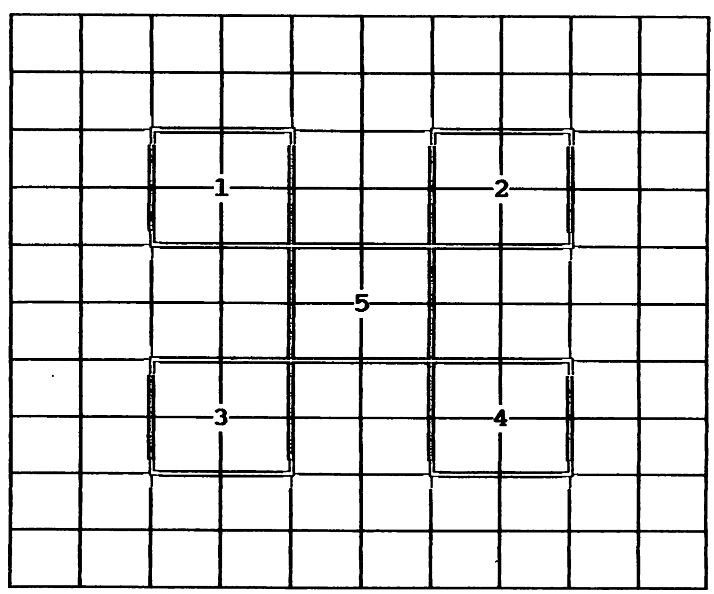

Fig. 1. Quadrat diagram: a 1 m^2 quadrat showing decimeter divisions. The number of divisions permit more accurate determinations of percent cover to be made.

sent one fifth the total. If numbers of individuals were needed, one could count the numbers of individuals in the five squares and multiply by 20.

The quadrat was laid over the turfgrass plot equidistant from each edge of the plot which measured 1.21 meters square. The percent cover was determined in each of the sampling squares by estimating the amount of cover of live grass in increments of 12.5% for each species. Therefore, a representative value for each species in each plot was obtained by totaling the percentage of cover in each of the five sampling squares of each quadrat.

Results and Discussion

Data collected in March 1991 on four turfgrass after an eight month period of establishment showed that St. Augustine cv. FX-10 demonstrated the highest percent coverage and Buffalograss cv. 'Prairie' the lowest. Table 1 represents the mean percentage cover 8 months after planting of the four turfgrass treatments under two 20 minute irrigation events per week. Evaluation of the data by the analysis of variance, with the level of type I error set at α=0.05, were found to be highly significant where $F_{3,64} = 84.954$, $p<0.0001$.

These data represents base line data for a much more involved split-split plot experiment involving the four turfgrass treatments vs. irrigation treatments. I hope that this information will not be available to those in the horticultural industry who may be skeptical about the FX-10 and to provide more information about possible problems with Buffalograss cv. Prairie in southern Florida on sand soils. The influences that can be made from this experiment are limited indeed, but recent discussions with sod growers who have had extensive weed invasion of buffalograss growing sites corroborate these results.

Table 1. Mean percentage of cover of 4 turfgrasses 8 months after planting.

N of Cases	Cultivars	Mean percentage of cover (± Standard error)
20	St. Augustine cv. FX-10	95.8 ± 1.7
20	Bahia cv. 'Argentine'	82.1 ± 5.0
20	Bahia cv. RCP-2	31.6 ± 6.4
20	Buffalo cv. 'Prairie'	19.6 ± 5.2

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TURFGRASS IN THE SHADE ENVIRONMENT

PHILIP BUSEY
Fort Lauderdale Research and Education Center
IFAS, University of Florida
3205 College Avenue
Fort Lauderdale, FL 33314

EDWARD H. DAVIS
R & D Sod Farms Inc.
674 N.W. 113th Drive
Okeechobee, FL 34972

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Abstract. **Earth's ozone layer is being destroyed, thus an increasing UV hazard gives people a legitimate complaint, "Why can't we sit and play in the grass, while enjoying the health benefits of tree shade?" The problem of growing grass in the shade will increase as people plant more trees, and as older landscape canopies mature. St. Augustinegrass, and to a lesser extent zoysiagrass and centipedegrass, tolerate partial tree shade, thus are more suitable for urban areas. The geometry and orientation of trees and buildings will most easily help homeowners and landscapers estimate the severity of shade. We explain a simple single-lens reflex (SLR) camera assay. The difficult region for growing Florida grasses appears to be where the SLR camera requires between 2 and 3 aperture stops or f-values to compensate for reduced illumination, compared with the open, unshaded environment. There are considerable differences among cultivars, with Bitterblue, Delmar, Jade, and Seville more shade tolerant than Floratam. Even so, proper management has a large potential benefit. Careful pruning, increased mowing height, reduced fertilization, and reduced irrigation are often effective in sustaining turf among trees. Integrated designs which consider the need of people for both trees and turf are a rational approach to a healthy landscape.**

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Trees in the landscape can reduce the need for turf irrigation and protect us from excess heat and UV radiation. Turfgrass works with trees to provide safe and sanitary play areas, and vantages to observe the diversity of organisms at the interface of pseudo-prairie and urban forest. Together, turf and trees provide the "sense of place" which is important emotionally. Human beings, especially their young, prefer park-like habitats, such as savanna and open forest scenes (Balling and Falk, 1982). The habitat preference for mixed communities of trees and understory has been viewed as a "hard-wired" trait, which is supported consistently by observations on peoples from around the world (Falk, personal communication). People have more than the desire for green spaces: They specifically demand park-like settings of trees and turf.

Landscape designers and managers in Florida repeatedly report a problem of growing grass underneath