



## **Auburn University Study**

### **Summary**

- **Nationwide Study at 21 locations in 12 states**
- **Comparative analysis of Sapphire, Palmetto, Raleigh and Floratam (at selected sites)**

### **Preliminary Results**

- **Sapphire Rated #1 for Growth Rate**
- **Sapphire Rated #1 for Overall Turfgrass Quality**

### **Sample Turf Plots 60 Days After Planting**



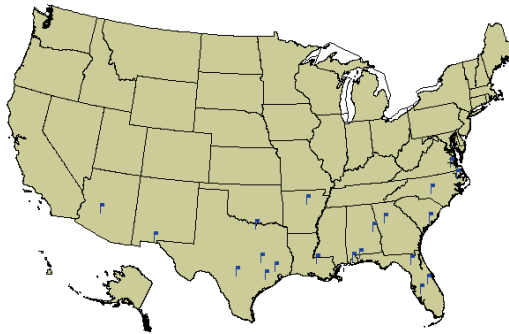
**Sapphire**



**Raleigh**



**Palmetto**



## **Sapphire St. Augustinegrass Comparative Evaluation**

**Interim Report April 20, 2005**

**Dr. David Han, Auburn University**

### **Introduction**

In the spring and summer of 2004, St. Augustinegrass plots were established at 21 sites throughout the southern United States. Most sites consisted of three plots each of the varieties Raleigh, Palmetto and Sapphire. Some sites also included the variety Floratam and two included Floratam instead of Raleigh. These plots were located either on sod farms or at university research facilities. Each variety was planted in three replicate plots and monitored for overall turfgrass quality, color, ground coverage, internode length between nodes 3 & 4 and nodes 7 & 8, and any disease or pest problems that may have occurred. This report outlines the data collected through the first summer of the project.

### **Locations reporting data for 2004-2005**

The following 16 locations reported data as of this interim report:

Auburn University, Auburn, AL	Southern Belle Turf Farm, Zuni, VA
Bethel Farms, Arcadia, FL	Trinity Turf, Pilot Point, TX
Cane Creek Sod, Cardwell, MO	Turf Grass Farms, Welch, LA
Carolina Turf, Raeford, NC	University of Florida WFREC, Jay, FL
Del's Nursery, San Antonio, TX	Wittig Grass Farms, Boling, TX
Double Springs Grass Farm, Searcy, AR	
Evergreen Turf, Tempe, AZ	
Gardener Turfgrass, Santa Teresa, NM	
H&H Sod, Kenansville, FL	
Hampton Roads Agricultural Research and Extension Center, Virginia Beach, VA	
Murff Turf, Crosby, TX	
Sod Solutions Research Center, Mt. Pleasant, SC	

## **Preliminary results**

It should be stressed that and conclusions made from the data gathered until this point in the evaluation are preliminary. Several sites planted significantly later than others and the overall rating and care schedule was adjusted through the first summer of the experiment. Significant changes may occur in the plots as the grasses emerge from winter dormancy, mature and enter their second year of growth. Part of the plan for the second summer of the study is an evaluation of drought tolerance on mature stands. The results of these experiments may have a large impact on the conclusions drawn at the end of the study, as may an exceptionally severe winter during the second year of the study. Nevertheless, one may draw several conclusions from the evaluation based on the performance of the grasses so far.

## **Growth rate and time to fill in from plugging**

All of the plots in this study were established via planting 3 inch square plugs on 18 inch centers. During the first summer, coverage was evaluated to determine the rate at which the varieties would grow in. Coverage was estimated visually by the rater and recorded as percent of plot area covered with grass. Coverage data were pooled for all locations on a month-by month basis and then analyzed. The data were arcsin transformed for analysis of variance, and means separated for each month using Fisher's Protected LSD. Although the data were transformed to normalize the distribution for analysis, they are presented in this report as percentages.

Comparisons in the rate of growth between Sapphire, Palmetto and Raleigh will be presented. At the Auburn site, Floratam was planted much later than these other three varieties, and no data on grow-in are available from other sites using Floratam.

There were significant differences for the months of June through September, when Sapphire had significantly greater coverage than both Raleigh and Palmetto (Figure 1). There were no significant differences in coverage between Raleigh and Palmetto. Sapphire also achieved full coverage (95%) in August, two months before Palmetto and Raleigh. Sapphire consistently demonstrated much more aggressive growth under establishment conditions than either Raleigh or Palmetto.

Another measure of Sapphire's aggressive growth was its significantly greater internode distance both between nodes 4 and 5 and between nodes 7 and 8. Raleigh was the next most aggressive grower with internode distances significantly greater than those of Palmetto (table 1).

Although the majority of locations reported full grow-in or close to full grow-in by October, there were some locations where the growth of Palmetto and Raleigh was much slower than average. At Gardner Turf farms, Sapphire had reached 90% coverage by September 16, but the coverage of Raleigh and Palmetto were only 40% and 18%, respectively. This is a much greater discrepancy than average and, in fact, represents almost no growth of Palmetto at all. It is unknown exactly why Palmetto failed to grow at this location while Sapphire apparently did very well.

## **Overall Turfgrass Quality**

Turfgrass quality was rated on a 1-9 scale, with 1 representing dead grass and 9 perfect turf. Visual ratings were subjected to statistical analysis using ANOVA and where significant differences were

observed, means were separated using Fisher's protected LSD. When the data were pooled over all sites and rating dates, Sapphire clearly had a higher quality rating than either Raleigh or Palmetto (Table 2).

In order to determine how the different varieties perform at different times of the year, the quality ratings were pool across locations but broken down by month (Table 3). Sapphire had significantly higher quality ratings than either Raleigh or Palmetto throughout the summer, from the month of June until September. In October, no significant differences were observed, but in November, Sapphire had significantly higher quality than Palmetto but not Raleigh. From December through March, there were no significant differences in quality ratings among the three varieties, as might be expected during a time when they all were essentially dormant at most locations. Some of the quality ratings observed during the winter months may seem excessively high for dormant turf; it is inferred that the raters were rating the plots at this time mostly on texture, density and pest pressure and not color.

In April, interestingly, Palmetto had a significantly higher quality rating than Sapphire or Raleigh. This could suggest that Palmetto is faster to break dormancy and green-up during the spring. It must be emphasized that April quality rating data are only available for the Auburn University and Sod Solutions Research Center locations at this time. It is unknown whether Palmetto will have higher quality in April at other sites.

However, in an email communication, Dr. Jeffrey Derr at Virginia Tech estimated that the percent greenup on the plots at the Hampton Roads research center on April 19 was as follows: Palmetto 33%, Raleigh 23% and Sapphire 9%. This agrees with visual estimates of percent greenup at the Auburn University plots. On April 15, the greenup status of the varieties was: Palmetto 92%, Raleigh 83%, Sapphire 75% and Floratam 65%. These differences in the Auburn plots are significant.

In summary, Sapphire demonstrated superior quality to both Raleigh and Floratam in the summer and early fall. However, Palmetto appears to have superior quality in the early spring. This is not due to an advance in Palmetto's quality; Palmetto's ratings were consistently between 5.8 and 6.8 during the year and its April rating of 6.5 is mediocre. However, it does not seem to have lost as much quality as either Sapphire or Raleigh during the winter. Sapphire appears to be fairly slow to break dormancy and green-up in the spring, although it was not as slow as Floratam at the Auburn plots.

It should also be noted that a March 15 application of atrazine at the Auburn University Turfgrass Research Unit resulted in a severe yellowing of Sapphire plots just emerging from dormancy. Although all varieties were somewhat chlorotic after the application, the effect was most noticeable on Sapphire. This also may indicate that Sapphire is somewhat sensitive while it is breaking dormancy, and it may require gentler treatment during this time than either Palmetto or Raleigh. Care should be taken when applying herbicides to any grasses emerging from dormancy, of course.

### **Diseases and Insects**

Disease and insect activity was sporadic at most locations and it is not possible to make definite conclusions about these varieties and their resistance to disease and insect pests at this time. At Carolina turf, there was one month (August) when gray leaf spot was severe on some plots, but there were no significant differences between the varieties in the severity of GLS. Otherwise, pest pressure

was light. Several raters observed a small background amount of gray leaf spot on all varieties. Some GLS was observed at Auburn, but it was not enough to affect overall quality ratings. Chinch bugs were not reported.

One may speculate that should a heavy infestation of GLS or some other pest occur during the summer, Sapphire's extremely fast growth rate may allow it to recover more quickly or even outgrow light infestations. However, until a major disease or insect problem occurs, this will remain only speculation.

### **Future directions**

As was mentioned previously, the project will continue for the next summer. With the plots at most sites completely established, it will be time to observe how Sapphire and the other grasses fare under more "normal" maintenance conditions. If possible, a "dry-down" will be conducted at as many locations as can manage it. The grasses will be deprived of water for a period for two weeks to evaluate drought stress tolerance. Also, any pest problems that may occur will be evaluated, as will the way the grasses behave going into winter as an established stand, and the way they behave coming out of a second winter. Cooperators should begin to watch out for thatch development, and report if excessive thatch occurs, especially in the very fast-growing Sapphire.

It is hoped that more spring green-up data will arrive soon to determine whether Palmetto indeed is superior to Sapphire at this time of year. Palmetto is known to have excellent cold tolerance, so it is not shocking that it is ahead of the other varieties right now, but if the data from last year are any indication of future performance, Sapphire will soon be overtaking Palmetto in the quality ratings.

In summary, Sapphire has shown the most aggressive growth and highest summertime quality of the varieties in the SSCE. However, Palmetto has emerged from dormancy the fastest and currently has the highest quality. Sapphire's fast growth will probably enable it to recover very quickly from any winter injury, but it remains to be seen how Sapphire will fare over many years, especially if unusually cold winters occur.

Table 1. Mean distance between nodes in St. Augustinegrass cultivars, 60 DAP

Variety	Distance between Nodes 4 & 5	Distance between Nodes 7 & 8
Sapphire	4.8 cm	4.9 cm
Raleigh	4.4 cm	4.6 cm
Palmetto	3.8 cm	4.1 cm

LSD (0.05)                      0.3                                      0.3

Table 2. St. Augustinegrass Quality evaluated across all rating sites and dates

Variety	Mean Quality Rating
Sapphire	7.0
Raleigh	6.2
Palmetto	6.1

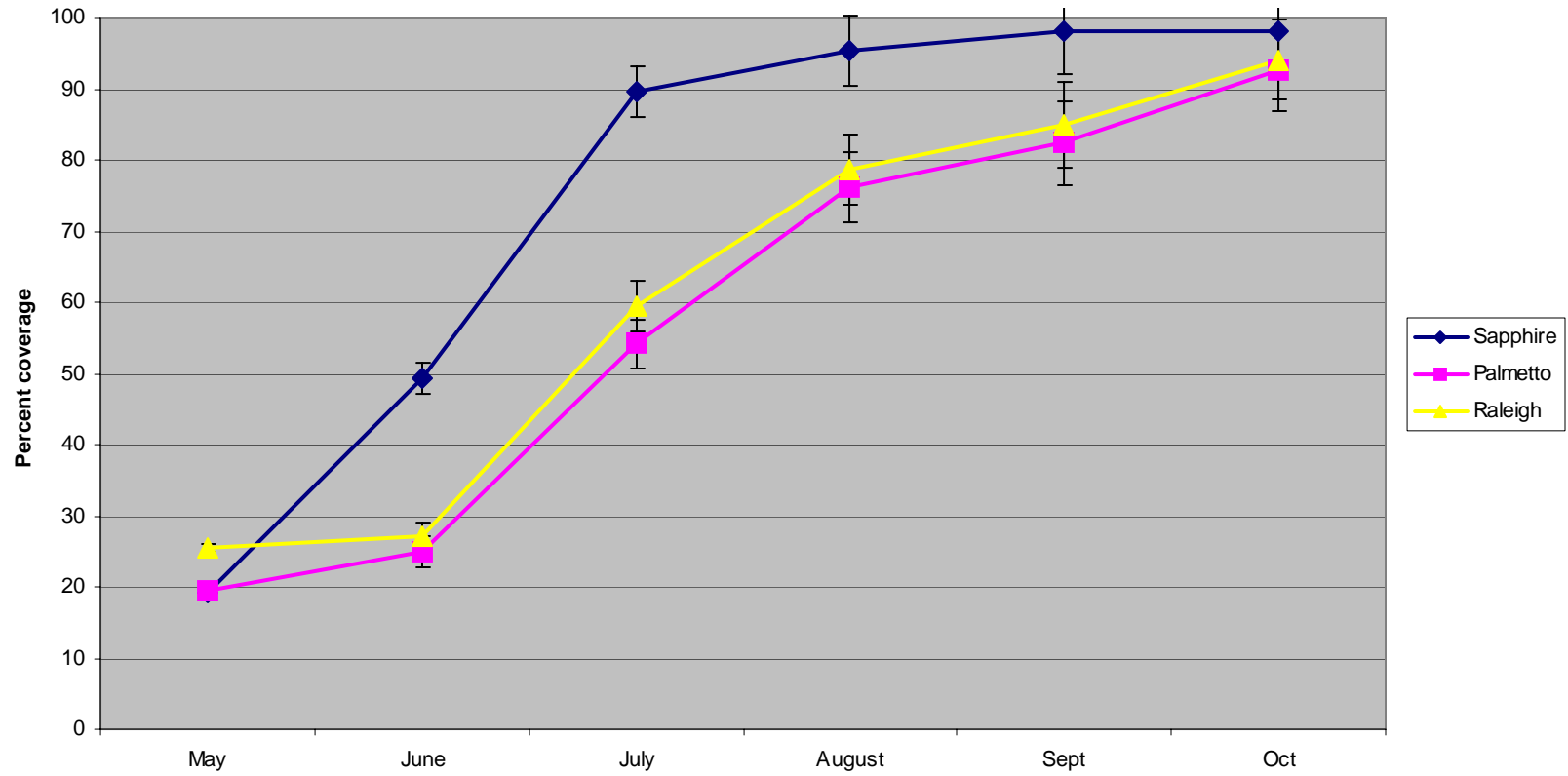
LSD (0.05)                      0.3

Table 3. St. Augustinegrass quality ratings by month from May 2004 to April 2005 across all locations

Variety	Mean Quality Rating											
	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Sapphire	7.1	7.4	7.5	7.1	7.0	6.7	7.3	7.1	6.5	5.3	6.3	6.0
Raleigh	6.8	6.0	6.0	6.0	5.8	6.8	6.7	6.4	6.4	5.0	6.2	5.8
Palmetto	6.5	6.1	5.8	5.8	5.3	6.3	6.3	6.8	6.6	5.9	6.7	6.5

LSD (0.05)    1.0    0.8    1.0    0.8    1.0    1.3    0.7    0.9    1.0    1.4    0.6    0.5

Figure 1. Growth of St. Augustinegrass varieties, 2004  
Average coverage across all sites



Quality ratings by month

