University of Florida Field Days

Look Where Our Research Dollars Go!

In the last issue of the *Florida Green* we mentioned the association's annual budgeting process and how research funds are derived. In this follow-up article, take a look at the nearly three dozen research projects that were on display at the 1998 University of Florida Field Days in July.

Sometimes, the total scope of all the ongoing research gets lost in the focus on a few "hot button" issues. Our local and state fund-raising efforts help support continuing basic research and evaluation of products and programs which are essential as regulatory parameters change and new chemistry and grasses are developed.

Dr. Al Dudeck discusses the successes and failures of 40 bermudagrass selections being evaluated for use on fairways. Photo by Joel Jackson.

G.C. Horn Memorial Turfgrass Laboratory:

Fertility, Nutrition, Growth Regulators and Environmental Impact Studies:

1. Comparison of Viking Ship and standard fertilization programs for golf greens and fairways – J.B. Sartain

Dr. Grady Miller explains the rhizotron operation and discusses the deficit irrigation vs. quality parameters study being done there. The rails in the foreground and background running left to right support a rolling roof to keep rainfall off the test cells. Photo by Joel Jackson.

A precise nutrient plan has been developed by Hydro-Agri (Viking Ship Fertilization Program) involving specific application times and materials. This project will compare the Hydro-Agri nutrient management plan with a standard plan. Turfgrass growth and quality will be compared using the two plans.

2. Effects of types and rates of N on growth and quality of turfgrasses – J.B. Sartain

Evaluate the effectiveness of different slow-release N sources in promoting growth and influencing quality of Tifway bermudagrass and ryegrass. Determine the application rate and environmental conditions on the response of the slow-release materials.

3. Comparative responses of Pursell's new coated products to other N sources under two N fertilization schemes on Tifway bermudagrass – J.B. Sartain

Evaluate the effectiveness of two new standard-sized coated urea products relative to five commercially available slow-release N sources applied at two rates to Tifway bermudagrass and maintained under fairway conditions. The N sources will be compared along with ammonium sulfate with 75% of the applied N originating from the slow-release sources.

4. Effects of Fe sources on growth, quality, and nutrient uptake of bermudagrass – J.B. Sartain

Initiated to determine growth, quality, and iron uptake response of bermudagrass to the application of experimental iron sources. Study the staining potential of the various iron sources when left on a concrete surface under moist conditions.

5. Comparative responses of cool and warm-season turfgrasses to liquid and solid sources of N and K – J.B. Sartain

Various N and K nutritional products applied in different frequencies and rates to determine their influence on growth rate, visual quality, and nutrient uptake of cool- and warm-season turfgrasses and on maintenance of quality during transition from cool- to warm-season turfgrasses.

6. Influence of two growth regulator products on TifSport bermudagrass grow-in – J.B. Sartain

This research will evaluate the influence of different formulations of gibberellic acid (a known growth regulator) on top and root growth of TifSport bermudagrass during establishment over a 12-week period.

Turfgrass Breeding, Evaluation and Field Trials

7. Bermudagrass Fairway Trials – A.E. Dudeck

Forty bermudagrass selections were plug-planted June 27, 1995 in field plots at the IFAS Turfgrass Field Laboratory,

Gainesville. Plots are being fertilized with a total of either six or three pounds of nitrogen per 1000 square feet per growing season. Plots are being mowed five times per week at a height of 0.5 inches. Seven of the best-performing grasses were planted in fairway trials at the Palm Beach National Golf Course, at the Grand Cypress Golf and Country Club, and at the Gainesville Country Club.

8. Ultradwarf Bermudagrass Trial – A.E. Dudeck

Eight bermudagrass selections were plug-planted Aug. 5, 1997 in field plots to evaluate performance of ultradwarf bermudagrasses Champion, FloraDwarf, MS Supreme, and TifEagle. Plots are being fertilized weekly with 0.5 pounds of nitrogen per 1000 square feet. Plots are being mowed five times per week at a mowing height of 0.19 inches during the growing season. Clippings are being removed. After complete establishment of all grasses, alleys will be allowed to close and mowing height will be reduced to 0.12 inches.

9. St. Augustinegrass Performance In North Florida – A.E. Dudeck

Twelve St. Augustinegrasses were plug-planted on Aug. 8. 1995 in field plots at the IFAS Turfgrass Field Laboratory, Gainesville. Plots were fertilized with a total of four pounds of nitrogen per 1000 square feet per year. Plots were mowed three times per week during the growing season with a mulching mower set at a height of 2.0 inches. After two years, grasses having best turf quality, which averaged 5.6 on a scale of 1 to 9 where 9 = best turf quality, included FHSA-115, FHSA-117, FL 1997-6, Floralawn, Floratam, Floratine, MSA-11, MSA-31, and Palmetto. Grasses having best turf density scores, which averaged 7.2 on a scale of 1 to 9 where 9 = best density, included FL 1997-6, MSA-11 , and MSA-31.

10. 1997-1998 Overseed Trials on Fairway and Putting Green Bermudagrass – S . F. Anderson and A.E. Dudeck

Forty-three cool-season turfgrasses were overseeded on a Tifdwarf bermudagrass putting green and on a Tifway bermudagrass fairway at Gainesville. Studies were established from Nov. 7–14, 1997 and terminated April 30, 1998. On the putting green, grasses with best turf quality scores, which averaged 7.6 on a scale of 1 to 9 where 9 = best, included creeping bluegrasses, Poa reptans, DW 42 and DW 184, a mixture of 85% Power perennial ryegrass, Lolium perenne, with 15% 'Stardust' rough bluegrass; Poa trivialis; a mixture of 80% Catalina perennial ryegrass with 20% Winterplay rough bluegrass; and a mixture of 28% each of Atlantis, Imagine, and Lynx perennial ryegrass with 15% Fuzzy rough bluegrass. On the fairway, grasses with best seasonal turf quality scores, which averaged 7.2, included creeping bluegrasses DW 42, DW 184, and DW 208; and a mixture of 28% each of Atlantis, Imagine, and Lynx perennial ryegrass with 15% Fuzzy rough bluegrass.

11. Hawaii Bermudagrass Expansion – A.E. Dudeck

Twenty selections are being increased for field testing throughout the state. Seven of the best performing grasses were planted in fairway trials at the Palm Beach National Golf Course, at the Grand Cypress Golf and Country Club, and at the Gainesville Country Club.

12-13. Breeding Bermudagrass and Zoysiagrasses for Florida – B.T. Sculley

Thirty-seven genotypes of both bermudagrass and zoysiagrass along with known genetic standards are replicated twice in this study. This evaluation block in Gainesville is one of five statewide cooperative test sites for UF/IFAS turf germplasm.

14. National Bermudagrass Test – 1997 – A.E. Dudeck

This NTEP study is one of 17 being conducted throughout the southern United States. Sixteen bermudagrass selections were plug-planted Aug. 7, 1997 along 18 seeded types, which were planted Aug. 12, 1997 in field plots at the IFAS Turfgrass Field Laboratory, Gainesville. Plots are being fertilized at a rate of 4.0 pounds nitrogen per 1000 square feet per growing season. Plots are being mowed at least three times per week at a height of 0.5 inch.

15. St. Augustinegrass Cultivar Breeding and Evaluation Program – R T. Nagata

The goal of the St. Augustinegrass breeding and evaluation program is to identify superior lines that can fill the current and future needs of the citizens of Florida and the southeast United States. These lines will be acceptable to both commercial sod producers and end users (homeowners, etc.), while minimally impacting the environment and require fewer resources for growth.

This research plot represents a part of the statewide evaluation program that has the same 100 lines planted in Jay, Gainesville, and Belle Glade. The turfgrass here was established as plugs June 27, 1997. At this time, several lines appear to be promising and will be advanced for further studies. These lines are NUF-23, NUF-32, NUF-56, NUF-80, NUF-94, NUF-129, NUF-148, NUF-155, NUF-164, and NUF 175. All of these lines have uniform appearance, are quick to grow into the plot area, and have very little gray leaf spot disease. Selected lines will be evaluated in larger plots under commercial turf production practices to study end use potential and longevity.

16. National St. Augustinegrass Test - 1996 – A.E. Dudeck

This study is one of seven being conducted throughout the southern United States. Ten St. Augustinegrass selections were plug-planted Aug. 15, in field plots at the IFAS Turfgrass Field Laboratory Gainesville. Plots are being fertilized at a rate of 2.0 pounds nitrogen per 1000 square feet per growing season. Plots are being mowed weekly with a mulching mower set at 2.5 inches. During the 1997 growing season, best turf quality, which averaged 7.7 on a scale of 1 to 9 where 9 = best turf quality, was produced by FHSA-115'. Second best group of grasses that produced acceptable turf quality scores, which averaged 6.1, included Delmar, FHSA 117, Floratam, Raleigh,

and 6-89-70 St. Augustinegrass.

17. National Zoysiagrass Test – 1996 – A.E Dudeck

This study is one of 16 being conducted throughout the southern United States. Sixteen zoysiagrass selections were plug-planted Aug. 19, 1996 along with eight seeded-types, which were planted Aug. 21, 1996 in field plots at the IFAS Turfgrass Field Laboratory, Gainesville. Plots are being fertilized at a rate of 0.5 pound nitrogen per 1000 square feet per growing month. Plots are being mowed weekly with a mulching mower set at a 2.0 inches.

Seeded cultivars of Chinese common, J-36, J-37, Korean common, Z 18, Zen-400, Zen-500, and Zenith produced unacceptable turf quality during the 1997 growing season. This was predominately due to mole cricket activity. Mean turf quality averaged 4.2 on a scale of 1 to g where 9 = best turf quality.

Vegetative zoysiagrasses having best turf quality scores, which averaged 6.6 included El Toro, HT-210, Jamur, Miyako, and Zeon.

18. Tall Fescue Germplasm Evaluation – R. R. Duncan and G. M. Prine

Plots of 10 tall fescue experimental lines from Dr. R.R. Duncan, University of Georgia, and four experimental lines from Dr. G.M. Prine, University of Florida, were seeded Jan. 9, 1998 in field plots located at the IFAS Turfgrass Field Laboratory, Gainesville.

The purpose of this study is to screen for genotypes with heat and drought tolerance. A complete fertilizer totaling 2.0 pounds of nitrogen per 1000 square feet per growing season was applied during the winter growing season. Plots are being mowed weekly with a mulching mower at a height of 2.5 inches. No supplemental irrigation during the summer season was to have been applied, but due to the extended spring/summer drought, supplemental irrigation is being applied.

Herbicide and Nematicide Control Evaluations

19. Season-Long Grassy Weed Control With Various Preemergent Herbicides – G L Miller and J.S. Weinbrecht

Devrinol, a preemergent herbicide recently registered for use in ornamentals and turfgrass, was evaluated for summer annual grassy weed control in a stand of Tifway II standard comparison included Barricade, Dimension, Pendulum, Ronstar, and Surflan.

Plots were seeded with goosegrass and southern crabgrass at 30 seed/sq. ft. At 90 days after initial application, good (80%) goosegrass and southern crabgrass control was evident following all treatments. Despite irrigation efforts to maintain a healthy turf, there was concern regarding questionable germination response through the unusually dry spring. To address this concern, an additional seeding was made July 7 in anticipation of more typical summer rain events, and to further evaluate season long efficacy.

Additional efficacy ratings were available for spotted spurge and globe sedge seedlings which became evident throughout the trial area during May and June. In this trial, good spotted spurge control was evident only with Pendulum. Good globe sedge seedling control was evident with Devrinol, Dimension, Pendulum, and Ronstar. Evaluation will continue through the winter season to monitor annual bluegrass efficacy.

20. Dr. Dunn has nematicide studies at the Turf Laboratory and the Envirogreen. See the Fall 1998 Florida Green.

Envirotron Complex

Rhizotron

21. Relationship Between Deficit Irrigation of Lawn Grasses and Quality Parameters. G.L. Miller and F.S. Zazueta

The purpose of this project is to measure St. Augustine and bahaia turfgrass water consumption under stress in order to determine reduced-irrigation turfgrass water use coefficients. A computer control system was designed and installed to implement the following irrigation strategies: 1) timer based historical data, 2) daily water budgets, 3) sensor controlled, 4) neural network, and 5) visual stress.

Glasshouses

22. Phosphorus retention in USGA greens – E.A. Brown and J.B. Sartain

Determine the influence of sand coatings, soil amendments, and phosphorus source on the retention and leachability of P through a USGA green profile. Parameters include coated vs. uncoated sand; plain sand; Fe-humate, and peat amendments; and different sources of P fertilizer (MKP, 0-20-20, and CSP). Profiles were leached biweekly to evaluate leaching of P and tissue samples were harvested biweekly and evaluated for growth rate and nutrient

Dr. Jerry Sartain explains just one of eleven nutritional and environmental studies he has underway at the G.C Horn Turfgrass Field Lab and at the Envirotron Complex. Photo by Joel Jackson.

uptake. Iron and Al oxide coated sands with Fe-humate amendment retained more P. This study is currently in progress.

23. Lysimeter Study For Evaluation of Turfgrass Response to EDR Reject Water – O'Connor

24. Mini-lysimeters with bermudagrasses for K leaching evaluations – Kuen-Took Chung and J. B. Sartain

25. Cone-tainer production of turf samples for class demonstrations – G. L. Miller and T. Hoffner

26. The environmental impacts of golf greens establishment and post-construction maintenance – H.D. Gooding and J.B. Sartain

The impact of a choker-layer, soil physical amendments, N-fertilizer source and regime on N leaching during establishment and post-construction maintenance of a sand putting green were evaluated in two glasshouse studies. Preliminary results suggest that a choker-layer did not influence N leaching loss. Fertilizer source and physical amendments significantly affect leaching. Minimum N leached during post-construction maintenance period with all treatments.

Envirogreen and Glasshouses

27. St. Augustinegrass tissue N evaluation using a electronic chlorophyll meter. – G.L. Miller and I.R. Rodriguez

Evaluate the utility of a hand-held chlorophyll meter (SPAD 502) to assess the nitrogen status of St. Augustinegrass. Utilize this new technology to compare leaf chlorophyll measurements, tissue nitrogen and tissue iron as to their usefulness for predicting turf quality of St. Augustinegrass. Due to the cost and inconvenience of testing, most N fertilizer application recommendations are still based on fertilizer application schedules without measuring for plant deficiencies. A quick reliable method to diagnose turfgrass N status would be a valuable tool for golf course superintendents, consultants, and researchers.

Graduate student Ian Rodriguez explains how fast tissue-sample analysis is with Near Infrared Reflectance Spectroscopy (NIRS). The turnaround time is measured in hours instead of days. Photo by Joel Jackson.

28. Soil and Turfgrass Analysis Correlation – J. R. Higby and J. B. Sartain

By applying N, P and K at incremental rates, a range of plant available nutrients was established in the plant tissue and the underlying soil of two bermudagrass cultivars. This matrix allows for a statistical correlation to be performed by quantifying these parameters along with the results from frequent visual quality ratings.

Additionally, a mirrored, mass-balance lysimeter study is being conducted concurrently to determine any adverse environmental effects resulting from these differing application rates. This study will also provide an opportunity to evaluate new, site-specific, rapid analysis techniques over a wide range of nutritional values.

29. Nitrogen scheduling on USGA golf greens using NIRS technology – G.L. Miller and I. R. Rodriguez

Inconvenience and slow turn-around time restrict the usefulness of traditional wet chemistry tissue analysis for diagnosing N status in turfgrasses. Evaluate the utility of near infrared reflectance spectroscopy (NIRS) in developing fertility programs for bermudagrasses grown on a USGA green. NIRS results correlated positively with Kjeldal N analysis (standard wet-chemistry analysis). This study shows that using NIRS for N fertility scheduling can result in high quality turfgrass with reduced N fertilizer used compared to other scheduling techniques.

Additional studies under way:

30. Soil Stabilization Using Subsurface Stabilization Mats For Sand-Based and Native Soil Athletic Fields – G.L. Miller And J.S. Weinbrecht

A soccer field containing four Enkamat products was built in one of Gainesville's city parks using the native soil. The field was sprigged to Tifway bermudagrass and is currently being grown in for further evaluations. Evaluation parameters include surface hardness and turf wear. To gain a better understanding of Enkamat's surface stabilization qualities on a sand-based system, a greenhouse evaluation is currently being conducted. These evaluations will be

compared to a control (no Enkamat) for a total of five treatments.

31. Evaluation Of Soccer Field Surface Hardness And Ball Roll Characteristics For Development Of Performance Standards – G.L. Miller

The two UF varsity soccer fields are being intensively evaluated for surface hardness using the Clegg Impact hammer and ball roll characteristics using the Soccer Field Gauge. In this study, the UF soccer fields are sectioned off in grid fashion (80 grid quadrants) so that we can return to the same area for continued monitoring of the field surface hardness. Based on these evaluations, a set of performance criteria is being developed.

From left, Dr. Lawrence Datnoff and Dr. John Cisar lay out compost topdressing experiment on the nursery green at Palm Beach National G.C. Unidentified UF research assistant in the background applies compost mix. Photo by Mark Jarrell, CGCS.

Dr. Al Dudeck brought a whole array of fairway bermudagrass selections down from the test plots in Gainesville to be grown out under south Florida conditions. Photo by Mark Jarrell, CGCS.

32. Dislodgeability Of Turfgrass-Applied Pesticides And Implications For Human Exposure – R.H. Snyder And J.B. Sartain.

Chlorpyriphos, fenamiphos, isafos, 2, 4-D and dicamba were applied to bermudagrass (Cynodon dactylon L. x C. transvaalensis) at their labeled rates. Dislodgeability of these pesticides onto cotton fabric, leather, golf balls, golf club grips, club face and cheesecloth were examined over time. These data were used to develop a comprehensive risk assessment.

33. Impact of amendments on the mobility of nutrients and water retention of USGA greens – J. A. Comer and J.B. Sartain

Comparison of nutrient and water retention capabilities of several different amendments in lysimeters simulating USGA constructed greens with a bermudagrass crop. The amendments studied were organic matter, potassium polyacryla-mides, polyacrylamides, iron humate and zeolites. Amended soils had a higher tendency to retain nutrients and lower water usage in a USGA green than unamended soils.

IFAS Researchers Conduct Studies at Palm B. National

There comes a time when research studies need to leave the artificial world of the university test plot and be subjected to real world conditions. Two such studies are under way at superintendent Mark Jarrell's Palm Beach National Golf Club in Lake Worth.

IFAS Turf Coordinator Dr. John Cisar is teaming with plant pathologist Dr. Lawrence Datnoff to evaluate the effects of topdressing golf greens with a compost material, and plant breeder Dr. Al Dudeck has planted 40 fairway bermudagrass selections for evaluation under normal maintenance conditions. Stay tuned for developments and hopefully more news on other on-site projects.