TURFAX™

of the International Sports Turf Institute, Inc.

The International Newsletter about Current Developments in Turfgrass

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SAM SIFERS JOINS THE INSTITUTE

Dr. James Beard, ISTI President, is proud to announce that Col. Samuel I. Sifers joined the International Sports Turf Institute on May 1, 1995 as an Associate Turf Agronomist. Sam recently retired from Texas A&M University where he has had a very productive career as a Research Associate with the Turfgrass Research Program. His future Institute activities will involve research, adult education, and turfgrass technical assistance with the turfgrass industry world-wide.

Algae - a major group of lower plants, often included in the Thallophyta, that are usually photosynthetic plants of extremely varied morphology and physiology. Now commonly considered to be a heterogeneous assemblage.

NEW ALGAE CONTROL IN PONDS?

Over several years I made visits to golf courses in the Munich, Bavaria, Germany area. I had the opportunity to observe a very interesting phenomena during regular visits to the Riedhof Golf Course. There were three small, shallow man-made ponds on one nine of the golf course that were struggling with algae problems. The Riedhof Golf Course Superintendent, Peter Shaw, learned of an occurrence in England where some bales of hay fell off a farmer's wagon and accidentally dropped into a small pond. Subsequently, he noticed that over a period of 3 to 4 weeks the algae in the pond decreased significantly.

Peter discussed this observation with me. He then placed 10 bales of 10 kg (22 lbs) wheat straw (*Triticum aestivum*) into one of the algae infested ponds. The shallow pond was approximately 1,000 sq. meters (10, 760 sq ft) in area by one meter (3.3 ft) deep. In 4 weeks that pond had a 50+% reduction in the algae level. There was no change in the amount of algae in the other two untreated ponds. Superintendent Shaw has repeated this procedure and found that the algae problem nearly disappeared. Is this is a new biological control? Perhaps it will work for you!

Note: Studies by Dr. Jeff Krans at a number of golf courses in Mississippi indicate that the species of algae occurring in irrigation ponds on golf courses are not the same species that occur on putting greens of each corresponding golf course.

SUMMERKILL CONCEPT

Winterkill is a commonly used terminology whereas summerkill is not. Why is this the case? Typically turf loss during the summer is identified specifically to a particular cause such as heat stress, drought stress, or a turfgrass disease or insect pest. In the case of heat and drought stresses, it is very difficult to distinguish the cause of death in mid-summer between these two stresses, even though they are distinctly different in terms of the mechanistic cause. Even many turfgrass researchers who report comparative field drought stress tolerance data among cultivars in research reports are drawing questionable conclusions and would be more correct to describe this summer loss complex as summerkill.

A typical example of the interrelationship between water stress and heat stress is exemplified among the cool-season species, particularly annual bluegrass (*Poa annua*). During heat stress one of the first occurrences is dieback of the root system with no new root initiation and replacement. Subsequently during periods of high evapotranspiration an internal plant water stress develops because the water loss by evapotranspiration is exceeding the rate of water uptake through the root system. Physiologically, one of the first changes as an internal plant water stress develops is closure of the stomata. On hot days the internal leaf temperature can rise to lethal levels above 104° F (40° C) in a matter of 30 to 60 minutes after stomatal closure. In this situation the final cause of death is heat stress, but it was induced as a result of an internal plant water deficit. This close interrelationship frequently occurs between heat and water stresses during the summer period. It also illustrates the dual or multiple effects of syringing turfs in mid-day. Not only is there a correction of any internal plant water deficit, but syringing also can affect the rate of heat build-up in leaf tissue at mid-day, especially under atmospheric conditions of low humidity.

PUBLICATION AVAILABLE:

1994 Rutgers Turfgrass Proceedings
Rutgers University. 173 pages.

This proceedings is divided into two sections. The first section contains 9 papers of lectures presented at the 1994 New Jersey Turfgrass Exp. The second section contains 6 technical papers of original research conducted by the turfgrass researchers at Rutgers University. Included are performance evaluations for a broad range of cultivars and near-release selections of five cool-season turfgrasses: perennial ryegrass (*Lolium perenne*), Kentucky bluegrass (*Poa pratensis*), bentgrass (*Agrostis* spp.), fine-leafed fescues (*Festuca rubra* and *F. longifolia*), and tall fescue (*Festuca arundinacea*). This research report is a must for anyone involved in specifying or selecting specific cultivars of cool-season turfgrasses for seeding or sodding turfed areas.
Contact: Department of Plant Science, Cook College, P.O. Box 231, New Brunswick, New Jersey, 08903, USA.
Phone: (908) 932-9400. U.S. $10.00

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The goal of the six issue per year TURFAX™ newsletter is to provide international turf specialists with a network for current information about turf. This newsletter is faxed to all Institute Affiliates that use the ISTI technical assistance services on an annual basis. Faxing is more costly, but ensures quick delivery to those outside the United States.

For non-affiliates, a TURFAX™ subscription is **available by annual payment of U.S. $60.00.** Payment may be made by sending a check to the address given below. Foreign orders please send a check or money order on a U.S. bank.

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J. B. VISITATIONS

Buenos Aires, Argentina - May

Participated in the first turfgrass conference-show to be held in Argentina. Presented a full day lecture before a group of landscape architects and contractors and a full two-day session before a golf course group. This was followed by a two-day equipment-chemical-seed show. Attendance was 3 times as large as anticipated, with attendees traveling from Chili, Uruguay and Brazil. This was a first for South America.

This area is the center of origin of Seashore paspalum (*Paspalum vaginatum*). There are fine textured strains of Seashore paspalum that invade putting greens in that portion of South America. The golf course superintendents would like to develop a chemical means of controlling the Seashore paspalum which is a weed for them. The reason being that the vertical leaf extension rate per day is extremely rapid at 2 to 3 times that of the adjacent bermudagrass (*Cynodon* hybrid). This causes a bumpy surface by mid-day following early morning mowing.

Also had the opportunity to visit the Jockey Club golf course designed by Alister Mackenzie and constructed in the 1920's. It was enjoyable to see his interesting design efforts preserved.

The one aspect that surprised me compared to travels in other parts of the world was the lack of modern irrigation systems on the golf courses in Argentina. I see this changing in the not too distant future as the government in that country now has the support of the populous with the economy improving significantly.

Rome and Turin, Italy - June

Visited the Italian Golf Federation (FIG) bentgrass cultivar research plots in Turin and also a new site in Rome where a set of turfgrass cultivar evaluation plots will be established this summer. Included will be (a) a bentgrass cultivar evaluation plot area maintained under putting green conditions and (b) a set of fairway/sports field cultivar evaluation plots involving a range of warm- and cool-season turfgrasses, with emphasis on perennial ryegrass *(Lolium perenne)*, bermudagrasses (*Cynodon* spp.), seashore paspalum (*Paspalum vaginatum*), and zoysiagrasses (*Zoysia* spp.). The cooperation of the many companies who are providing seed and vegetative plant material to the Italian Golf Federation for establishment of these evaluation plots is certainly appreciated.

The Mediterranean coast of southern Europe it is a transition zone where both warm- and cool-season turfgrasses can be grown. One of the emerging problems is the lack of water for turf irrigation. Thus, there is the need to use more drought tolerant, low water warm-season turfgrass species. When this is discussed, there is a hopeless reaction, with the response that there is no seed for these grasses available. Thus, they use the cool-season grasses which are seeded. Hopefully the plots established in Rome will broaden their perspective relative to the value of vegetatively established turfgrasses for low water availability areas.

Rolesville, North Carolina - June

Presented a tour stop at the Turf-Seed Field Day on International Turfgrass Trends. A very interesting aspect in the breeding program is the development of germplasm sources with some resistance to brown patch (*Rhizoctonia solani*). Resistance to this pathogen is relatively rare across plant species. Thus, this is certainly a significant development.

UPCOMING J B VISITATIONS

Provided for Institute Affiliates who might wish to request a visitation when I'm nearby.

- July 19 to 21 - Columbus, Ohio.
- July 22 to 26 - Montreal, Canada.
- August 3 to 6 - Lansing, Michigan
- September 5 to 12 - Portland, Oregon.
- October 1 to 9 - Italy and Europe.

FLoraTeX™ - A NEW BERMUDAGRASS CULTIVAR RELEASED FOR LOW MAINTENANCE TURF AREAS

FLoraTeX™ bermudagrass is a joint release of the Florida and Texas Agricultural Experiment Stations, by A.E. Dudeck, J. B Beard, J.A. Reinert, and S.I. Sifers. FLoraTeX™ is one of the best low maintenance turfgrass for cemeteries, golf course fairways and roughs, lawns, parks, and sports turfs in the warm-humid and warm-semiarid climatic regions of the United States. Its low nitrogen stress tolerance, drought resistance, and dehydration avoidance are much better than for buffalograss (*Buchloe dactyloides*) and zoysiagrass (*Zoysia* spp.)

Origin:

FLoraTeX™ is thought to have been introduced into the United States as 'Franklin' on Feb. 18, 1954 by the African Explosives and Chemical Industries, Ltd., Johannesburg, Transvaal, South Africa. It was assigned a USDA PI number 213385. It was collected from a putting green that was severely damaged by mealybugs (*Antonina indica*) at Mount Edgecomb Golf Course, Natal, South Africa.

The original PI 213385 was lost at the Southern Plant Introduction Center. FLoraTeX™ was chosen as a registered trademark name for the experimental bermudagrass tested throughout the south as FB-119.

Merits:

- Widely adapted throughout the warm-humid and warm-seminarid regions, especially under low maintenance inputs.
- Very low nitrogen (N) requirement due to superior nitrogen stress tolerance, one of the best.
- Excellent drought resistance, one of the best.
- Excellent dehydration avoidance, or green color retention during drought, one of the best.
- Low evapotranspiration rate.
- Superior rooting depth and mass.
- Widely adapted to soil pH, especially on alkaline soils.
- Excellent fall low temperature color retention.
- Very early spring greenup.
- Medium shoot density and leaf texture.
- Good wear tolerance.
- Resistant to bermudagrass stunt mite (*Eriophyese cynodoniensis*).
- Tolerant to the short-winged mole cricket (*Scapteriscus abbreviatus*).
- Tolerant to lance (*Hoplolaimus galeatus*) and spiral (*Helicotylenchus pseudorobustus*) nematodes.
- Least affected by dollar spot (*Sclerotinia homoeocarpa*) under low nitrogen stress.
- Can be identified by its starch gel electrophoresis banding pattern for the isoenzyme-aconitase.

Limitations:

- Must be vegetatively propagated by plugs, sprigs, or sod.
- Produces seedheads in late Spring.
- May produce viable seed which may contaminate turf with off-types.
- Susceptible to sting nematode (*Belonolaimus longicaudatus*).
- Poor shade adaptation, which is a characteristic of all bermudagrass cultivars.

Turf Performance Assessments:

The turf-type bermudagrass cultivars now in use generally fit into one of two groups. One group involves the dactylon bermudagrass (*Cynodon dactylon*) cultivars that tolerate low cultural inputs in terms of turfgrass maintenance, and yet produce an acceptable quality turf in terms of shoot density and leaf texture. A second group consists of the hybrid bermudagrass (*C. dactylon* x *C. transvaalensis*) cultivars that typically require higher cultural inputs to achieve high turfgrass quality. They also produce an inherently higher turf quality due to the their higher shoot density and narrower leaf texture than the first group. With these two general groupings in mind, FLoraTeX™ bermudagrass as described herein fits within the low maintenance dactylon bermudagrass group.

Most of the bermudagrass cultivar assessment studies during the 1960's and 70's were conducted under high nitrogen (N) levels. Thus, in 1978 J. Beard initiated studies at Texas A&M University to address the performance of the broad range of commercially available bermudagrass cultivars, both old and new, under lower nitrogen nutritional levels. Twenty-four cultivars were included in the study consisting of 90 sq. ft. (8.4 m^2) plots with 3 replications. A split plot treatment arrangement was used involving 3 rates of nitrogen: 0.5, 1.0, and 2.0 lbs of N per 1,000 sq ft (0.25, 0.5, and 1.0 kg/100 m^2) per growing month. As the studies were conducted on a high-sand root zone without a perched hydration zone, these rates would need to be halved in order to be equivalent to comparable turfgrass responses under fine textured, less leachable root zones. This study was of 15 year's duration. Among the commercially available *Cynodon dactylon* cultivars, FLoraTeX™ ranked at the top when mowed at a 1 inch (25 mm) height. Cultivars ranking lower included Texturf 10, Vamont, Tiflawn, and Arizona Common.

FLoraTeX™ bermudagrass produced acceptable seasonal turf quality when compared with 28 other experimental and commercial cultivars at 22 locations in 14 states throughout the southern United States during a 5-year study from 1986 to 1991. This indicates wide-spread geographical adaptation. FLoraTeX™ was consistently superior in turf quality compared to Arizona Common, Guymon, NuMex Sahara, and Sonesta and was comparable in performance to Midiron and Vamont. In Florida, FLoraTeX™ was superior in turf quality to Arizona Common, Guymon, and NuMex Sahara and was equal to the remaining 24 cultivars. The nitrogen level in these studies averaged 3.8 lbs (1.6 kg), but ranged from 1 to 6 lbs per 1,000 sq ft (0.5 to 3 kg/100 m^2) per growing season. Soil conditions at the various state evaluation sites ranged from clays to loams to high-sand root zones.

Nitrogen Stress Tolerance:

A unique and superior characteristic of FLoraTeX™ is its ability to form an acceptable turf under low levels of nitrogen (N) fertilization. When combined with its superior dehydration avoidance and drought resistance, FLoraTeX™ is a truly low maintenance turfgrass which can sustain the significant shoot density and growth rate needed for acceptable turf quality.

The ability of FLoraTeX™ to produce acceptable turf under very low nitrogen fertilization was first noted during 1970 to 1974 at Fort Lauderdale, Florida. FLoraTeX™ averaged 70% ground cover 3.5 years after receiving only 1.0 lb of N per 1000 sq ft (0.4 kg/100 m^2) per year. This is an average fertilization rate of 0.1 lb of N per 1000 sq ft (0.05 kg/100 m^2) per growing month. This contrasts with Tifway bermudagrass which averaged only 17% ground cover, while Arizona Common, Bayshore, and Everglades were unable to sustain growth at this extremely low level of nitrogen. Even at a medium rate of 0.6 lb of N per 1000 sq ft (0.3 kg/100 m^2) per growing month, Tifway produced an inferior turf of only 47% ground cover, while

FLoraTeX™ averaged 91% under the same nitrogen level.

In Texas, FLoraTeX™, as well as Texturf 10, were the best bermudagrass cultivars under low nitrogen stress. These cultivars were able to sustain acceptable turf quality over a 2-year period at 0.125 lb of N per 1000 sq ft (0.07 kg N/100 m^2) per growing month. Based on detailed root/shoot studies, Sifers and Beard postulated that these two cultivars have a unique hormonal mechanism that sustains growth at very low levels of nitrogen via balanced partitioning of the available nitrogen and carbohydrates which sustains both root and shoot growth.

In Gainesville, Florida the response of 9 of the best Fort Lauderdale bermudagrass selections were studied in the field for 3 years at 4 nitrogen rates ranging from 0.25 to 1.0 lb of N per 1000 sq ft (0.13 to 0.5 kg/100 m^2) per growing month. Acceptable turf quality of FLoraTeX™ was maintained at 0.3 lb of N per 1000 sq ft (0.15 kg/100 m^2) per growing month. In contrast, Tifway required a minimum of 0.5 lb (0.25 kg) of N, while Arizona Common required more than 1.0 lb (0.5 kg) of N per 1000 sq ft (100 m^2) per growing month to maintain acceptable turfgrass quality.

ADAPTATION:

Drought Resistance. Drought resistance is the ability to survive a severe water stress, which may encompass entering a brown dormant condition and then recovering subsequently when water is available. Assessments of drought resistance, based on the ability to greenup over a 30-day period following rewetting, were conducted on 28 bermudagrass cultivars after 158 days of drought stress during the summer of 1988 at College Station, Texas. FLoraTeX™ ranked very high in drought resistance in a group with Arizona Common, Everglades, NuMex Sahara, and Ormond. All the bermudagrass hybrids ranked significantly lower.

Dehydration Avoidance. Dehydration avoidance is the ability of a turf to retain a green shoot cover for an extended period of time during the onset of drought stress. Comparative dehydration avoidance, as assessed by percent leaf firing, of 28 bermudagrass cultivars was observed in the field during 158 days of drought stress in the summer of 1988 at College Station, TX. FLoraTeX™ ranked very high in dehydration avoidance along with Sonesta, NuMex Sahara, and Ormond. The dehydration avoidance of FLoraTeX™ is attributed primarily to its deep root system which penetrated to depth of over 6 feet (1.8 m) in root growth columns. In contrast, the Tifway root system penetrated only to a 4 foot (1.2 m) depth.

Wear Tolerance. As with most bermudagrass cultivars, FLoraTeX™ exhibited good wear tolerance. Among 17 cultivars evaluated in Texas, FLoraTeX™ ranked mid-range with Arizona Common, Bayshore, and Everglades after 800 revolutions of a wear simulator. Ormond, Texturf 10, and Tifway had superior wear tolerance.

SOURCE OF GRASS:

Foundation stock of FLoraTeX™ bermudagrass will be released to licensed growers only. FLoraTeX™ will be grown under strict certification standards to maintain its genetic purity. Information regarding availability of foundation stock may be obtained from Florida Foundation Seed Producers, Inc., P.O. Box 309, Greenwood, Fla. 32443 or Texas Foundation Seed Service, College Station, Texas 77843.

REFERENCE (for more details and data):

- FLoraTeX™ Bermudagrass. 1994. A.E. Dudeck, J. B Beard, J.A. Reinert, and S.I. Sifers. University of Florida Bulletin 891. 11 pages.