

YEAR-END REPORT - USGA RESEARCH  
November 1, 2000

1. **Title**

On-site Testing of Grasses for Overseeding of Bermudagrass Fairways

2. **Investigator/Cooperator**

Mr. Kevin Morris, Executive Director, National Turfgrass Evaluation Program  
Director of Research, GCSAA  
Dr. Michael Kenna, Director of Research, USGA Green Section

3. **Purpose**

To evaluate commercially available cultivars, blends and mixtures for their usefulness in overseeding of bermudagrass fairways

4. **Location of Project**

Ten golf courses across the southern half of the United States (see Table 1.)

5. **Introduction**

With the initiation of on-site testing of bentgrass and bermudagrass on putting greens, interest is now increasing for the evaluation of other grasses used on golf courses. Grasses are needed that provide exceptional playing surfaces with less pesticides, fertilizer and water. Therefore, grasses that have superior drought, cold, heat, disease and insect resistance need to be identified.

Overseeding bermudagrass fairways is a common practice throughout the southern half of the United States. Millions of pounds of seed are bought and sown each autumn on golf courses in this region. Golf course owners, managers and superintendents seek grasses that establish quickly, exhibit exceptional playability, are aesthetically pleasing and require less inputs. This project will evaluate new cultivars on bermudagrass fairways at golf courses in the Southern and Western U.S. This on-site testing program will provide scientific information of a more applied nature about cultivars for overseeding.

Information from this project will be valuable to the golfing industry because it will determine the adaptation of grasses for golf course use. Information obtained from on-site testing will be of particular value to plant breeders, researchers, extension educators, USGA agronomists, golf course architects, and superintendents who need to select the best adapted cultivars for overseeding in a particular regional climate.

6. **Methods**

The evaluation trials are jointly sponsored by the Golf Course Superintendents

Association of America (GCSAA), the United States Golf Association (USGA) Green Section and the National Turfgrass Evaluation Program (NTEP). Trial sites are located on golf courses near a land grant university with a turfgrass research program or in a major metropolitan area which is readily accessible to a university turfgrass scientist. Ten evaluation trial sites have been established. Trials are positioned strategically in the following areas: southern California, Arizona, Houston, TX, Dallas, TX, Mississippi, central Florida, Myrtle Beach, SC, Virginia, Atlanta, GA, and St. Louis, MO.

NTEP will function as the coordinating agent for this two-year cultivar trial. Because overseeded grasses provide a temporary playing surface mainly in fall and winter and are reseeded each year, cultivars will be seeded in two consecutive years (fall 1999 and fall 2000). Trials are conducted under the leadership of a university turfgrass research scientist (i.e. research cooperator, see Table 1), who has a faculty appointment. This person has signed a research agreement and will be responsible for establishment of the trial, coordination of the maintenance regime, collection and submission of the data to NTEP.

NTEP will solicit entries for the trial from sponsoring companies. Trials will be conducted with named cultivars and commercially available blends or mixtures. Various species used in overseeding, such as perennial ryegrass and *poa trivialis* will be allowed. Experimental lines that will be released in the immediate future (i.e. before the end of the testing cycle) may also be included in this trial at the sponsor's discretion.

Trials are located on active play sites where golfers hit fairway golf shots and/or drive golf carts. Plot size is large, 5' x 20', replicated three times. A large plot size allows for a greater distribution of traffic and divoting. Entries will be seeded in exactly the same location on each course for each year. This will allow researchers to identify entries that persist and never transition out.

Host clubs will provide daily maintenance of the fairway site. However, an advisory committee consisting of representatives from GCSAA, USGA, NTEP, universities and the turfgrass seed industry will provide recommended establishment and maintenance procedures. The superintendents chosen have excellent skills and a strong record of supporting GCSAA and the USGA. Each superintendent also has a good relationship with the university scientist, who will have ultimate responsibility for the trial.

NTEP will administer the program and its funding, set the advisory committee and gather their input and recommendations for the trial. NTEP will organize and distribute the seed which will constitute entries for each trial location. Also, NTEP will provide maintenance and data collection protocols to each site, collect, analyze and disseminate the performance data in annual and final reports, and conduct an annual site visit of each trial site.

The research cooperator will be responsible for data collection. The following data will be collected from each trial:

1. Percent establishment rate (4-6 weeks after seeding)
2. Turfgrass quality (monthly during winter, 2 - 4 times per month during spring and

- fall transition period)
3. Plot color, genetic color (twice - late fall/early winter and spring)
  4. Rate or speed of transition from bermudagrass to overseeded grass in fall (2 - 4 times per month during fall)
  5. Rate or speed of transition from overseeded grass to bermudagrass in spring (2 - 4 times per month during spring)
  6. Environmental stress, traffic and divoting damage, disease and insect damage and other data deemed appropriate and feasible by the research cooperator.

The research cooperator will be responsible for submission of data to NTEP by August 1 of each year. Annual funding will be based on receipt of a complete set of data by the August 1 deadline.

## VII. Results and Discussion

The forty-two (42) entries (see Table 2.) in this trial were seeded in September or October at the ten golf course sites. Establishment was good, no problems were seen with any entries.

Data has been compiled, statistically analyzed and reported for the first years' data from this trial. This data can be found in NTEP Report No. 00-13 and on the NTEP web site ([www.ntep.org/onsite/ost.htm](http://www.ntep.org/onsite/ost.htm)).

Nine of the ten test locations have been visited by NTEP and/or GCSAA research personnel. Following are general observations concerning the trials:

1. The *poa trivialis* varieties were generally slower to establish and develop into a dense stand than the perennial ryegrasses, also they exhibit a lighter green color than the perennial ryegrasses. The slow establishment may prohibit the use of straight *poa trivialis* for overseeding of fairways.
2. Several locations (Starkville, MS; Duluth, GA, Orlando, FL) used a drop spreader for seed distribution. This resulted in uneven distribution of seed in some areas of the plots. Fortunately, with 100 square foot plots, missed or skipped areas during seeding or non-uniform areas can be disregarded when rating plots. This subject has been addressed before seeding again in fall 2000.
3. The Charlottesville, VA site had a mix-up when seeding and seeded one row of plots twice. This was discovered after seeding and that row has been skipped and not evaluated. In addition, the superintendent at this course does not mechanically damage or open the bermuda on his fairways before overseeding. Overall, this resulted in a poor stand of the test. This fall, the area will be prepared more for overseeding to ensure a better establishment. Overseeding procedures at the other courses did not seem to affect trial establishment.
4. Overall, placement of the tests (physical location on the course) was very good with most being placed between the tee and the first landing area. Traffic distribution and divoting appeared uniform at the sites visited. The Orlando, FL

test is planted at their golf academy (teaching facility) and receives very little cart or foot traffic.

5. Transition from overseeding grass to bermuda started early in most sites as winter was mild and early spring was warm in many locations. However, a cool, wet April in the eastern portion of the U.S. slowed the transition by aiding the overseeding grasses.
6. Generally, entries were consistent in their performance from one location to another. Several of the perennial ryegrasses were excellent in fall and winter through early spring. Transition back to the bermudagrass varied by location. We believe this was mainly due to differing weather patterns between locations.
7. In general, the perennial ryegrasses as a group provided the highest quality turf. The exception was the high performance of the *poa trivialis* varieties and perennial ryegrass/*poa trivialis* mixtures at the Florida and Virginia locations. The Florida site had a severe *poa annua* invasion which may have been less noticeable in the *poa trivialis* plots. With the minimal preplant preparation at the Virginia site, the *poa trivialis*, being smaller seeded, had an easier time falling through the bermudagrass canopy and thus germinated better.
8. At most locations, there was no statistical difference in overall turfgrass quality between the top 25-30 entries (out of 42 total in the trial). We have seen this happen in past overseeding trials. This may reflect the unusual nature of overseeding. If an entry is very strong in the beginning and receives high quality ratings, it may receive low ratings during spring transition as it has competed too heavily with the bermudagrass, thus "holding back" the bermuda. Grasses that start slowly and receive low ratings initially, often become stronger later and receive higher ratings during transition.
9. A major concern of overseeding is having a smooth transition from overseeding grass back to bermudagrass in spring. In this first year data from most locations, the annual ryegrass and intermediate ryegrass entries transitioned quicker (going from 75-25% cover in 3-4 weeks) than the perennial ryegrasses. At the Arizona and Mississippi locations, *poa trivialis* entries and perennial ryegrass/*poa trivialis* mixtures transitioned faster than perennial ryegrass. However, at the California and Florida sites, the opposite was true. And in South Carolina and Texas sites, *poa trivialis*, intermediate ryegrass and the perennial ryegrasses transitioned in a similar fashion. Again, we feel these differences are weather and environment-related.
10. This fall, the trials will be seeded in exactly the same physical location as last year. This will allow us to document any carryover that may occur from one year to another. However, the Arizona site had to be moved to another course, due to a decision by the golf course greens committee to suspend overseeding. Therefore, we were forced to move the 2000 seeding to the Green Valley Country Club in Green Valley, AZ. Also, due to non-uniform irrigation problems at the Atlanta Athletic Club, the researcher had to choose another fairway to seed in fall 2000.

11. Overall, we are pleased with the quality, placement and consistency of the trials. Cooperation among the research scientists and superintendents has been excellent, thus far and the superintendents seem generally interested in this research. Also, other superintendents in each area have inquired about the trial or have come to visit.

## EXECUTIVE SUMMARY

### On-Site Testing of Grasses for Overseeding of Bermudagrass Fairways

Kevin N. Morris  
National Turfgrass Evaluation Program

With the initiation of on-site testing of bentgrass and bermudagrass on putting greens, interest is now increasing for the evaluation of other grasses used on golf courses. Grasses are needed that provide exceptional playing surfaces with less pesticides, fertilizer and water. Therefore, grasses that have superior drought, cold, heat, disease and insect resistance need to be identified. Overseeding bermudagrass fairways is a common practice throughout the southern half of the United States. Millions of pounds of seed are bought and sown each autumn on golf courses in this region. Golf course owners, managers and superintendents seek grasses that establish quickly, exhibit exceptional playability, are aesthetically pleasing and require less inputs. This project will evaluate new cultivars on bermudagrass fairways at golf courses in the Southern and Western U.S. This on-site testing program will provide scientific information of a more applied nature about cultivars for overseeding.

The evaluation trials are jointly sponsored by the Golf Course Superintendents Association of America (GCSAA), the United States Golf Association (USGA) Green Section and the National Turfgrass Evaluation Program (NTEP). Ten evaluation trial sites were chosen. Trials are positioned strategically in the following areas: southern California, Arizona, Houston, TX, Dallas, TX, Mississippi, central Florida, Myrtle Beach, SC, Virginia, Atlanta, GA, and St. Louis, MO. Trials are conducted with named cultivars and commercially available blends or mixtures. The trials are located on active play sites where golfers hit fairway golf shots and/or drive golf carts. Plot size is large, 5' x 20', replicated three times.

Data from 1999-2000 was compiled and published via hard copy and on the NTEP web site ([www.ntep.org/onsite/ost.htm](http://www.ntep.org/onsite/ost.htm)). Variety performance varied from location to location, however, general trends emerged. The perennial ryegrass entries, in general, provided the highest quality turf averaged over the entire season. The *poa trivialis* entries and perennial ryegrass/*poa trivialis* mixtures were slower to establish and lighter green in color. This reduced their quality ratings at most locations, but at two locations, other factors such as reduced *poa annua* invasion, put the *poa trivialis* entries on top. Turfgrass quality ratings averaged over the entire season, yielded small levels of significance at most locations. In other words, at most sites, one-half to two-thirds of the entries performed statistically similar to the top entry.

The data does, however, reveal differences in spring transition from the overseeding grass to bermudagrass. The annual ryegrass and intermediate ryegrass entries transitioned faster than the most all perennial ryegrass entries. At some sites, the entries that contain *poa trivialis* transitioned back to bermuda faster than perennial ryegrass. At other sites, the opposite was true, the perennial ryegrasses disappeared quicker in spring than *poa trivialis*. At a couple of other locations, the *poa trivialis* and perennial ryegrass entries transitioned in a similar manner. This leads us to believe that this transition phenomenon is highly weather-related.

TABLE 1. TRIAL LOCATIONS - ON-SITE TESTING GRASSES FOR OVERSEEDING OF BERMUDAGRASS FAIRWAYS

*Sponsored by USGA, GCSAA and NTEP*

Location	Golf Course	Superintendent	Research Cooperator	University/Institution
Tucson, AZ	Tucson Country Club	Marty Wells	Dr. David Kopec	Arizona
Palm Desert, CA	Mountain Vista	Nancy Dickens	Dr. Robert Green Mr. Mike Henry Mr. Jeff Place	California-Riverside Calif. Cooperative Ext. C. O. D.
Orlando, FL	Grand Cypress	Tom Alex	Dr. Al Dudeck	Florida
Duluth (Atlanta), GA	Atlanta Athletic Club	Ken Mangum	Dr. Gil Landry	Georgia
Mississippi St., MS	Mississippi State Univ.	Pat Sneed	Dr. Jeff Krans	Mississippi State
Crescent, MO (St. Louis)	Players Club at St. Louis	Todd Marquette	Dr. Erik Ervin	Missouri
Myrtle Beach, SC	Blackmoor	Bob Zuercher	Dr. Bruce Martin	Clemson
Garland (Dallas), TX	Fire Wheel Golf Park	Gary Chambers	Dr. Milt Engelke	Texas A&M-Dallas
The Woodlands, TX (Houston)	The Woodlands	Scott Hamilton, Gant Austin	Dr. Richard White	Texas A&M-College Station
Charlottesville, VA	Glenmore C.C.	Tim Thomas	Dr. David Chalmers	Virginia Tech

TABLE 2. ON-SITE TESTING OF GRASSES FOR OVERSEEDING OF BERMUDAGRASS FAIRWAYS

Entries and Sponsors

Entry #	Name	Species or composition	Sponsor
1	Allsport	perennial ryegrass	LESCO, Inc.
2	LS-DE1	perennial ryegrass	LESCO, Inc.
3	Proam	poa trivialis	LESCO, Inc.
4	Barlennium	perennial ryegrass	Barenbrug USA
5	Pirouette	perennial ryegrass	Barenbrug USA
6	Bariviera	poa trivialis	Barenbrug USA
7	Professional's Select	40% Windstar, 35% Sonata, 25% Jet p. ryegrass blend	Pennington Seed, Inc.
8	Transist	intermediate ryegrass	Pickseed West, Inc.
9	Pick HR A-97	intermediate ryegrass	Pickseed West, Inc.
10	First Cut	85% Paragon p. rye, 15% Stardust poa trivialis	Turf Merchants, Inc.
11	Brightstar II	perennial ryegrass	Turf-Seed, Inc.
12	Charger II	perennial ryegrass	Turf-Seed, Inc.
13	Citation III	perennial ryegrass	Turf-Seed, Inc.
14	Brightstar II + Winterplay	85% Brightstar II p. rye, 15% Winterplay poa trivialis	Turf-Seed, Inc.
15	Charger	perennial ryegrass	Standard Entry
16	Citation III + Winterstar	85% Citation III p. rye, 15% Winterstar poa trivialis	Turf-Seed, Inc.
17	Winterplay	poa trivialis	Standard Entry
18	ABT-99-3.268	annual ryegrass	AgriBioTech, Inc.
19	Paragon	perennial ryegrass	Turf Merchants, Inc.
20	PST-3BK-99	perennial ryegrass	Pure-Seed Testing, Inc.
21	Fiesta 3	perennial ryegrass	Pickseed West, Inc.
22	Futura 2500	33% Cutter p. rye, 33% Sunshine p. rye, 33% Transist intermediate rye	Pickseed West, Inc.
23	MED-007	25% JR-151, 25% JR-142, 25% JR-128, 25% JR-265 p. ryegrass blend	Simplot Turf & Horticulture
24	Capri	perennial ryegrass	DLF Trifolium
25	Leaderboard	34% Pennant II, 33% Panther, 33% Seville II p. ryegrass blend	Independent Seeds
26	Seville II	perennial ryegrass	Independent Seeds
27	Snowbird	poa trivialis	Independent Seeds
28	MP58	perennial ryegrass	Jenks Seed Connection
29	Prime	33% Elfkin, 33% MP58, 33% MP88 p. ryegrass blend	Jenks Seed Connection
30	Elfkin	perennial ryegrass	Jenks Seed Connection
31	MP111	perennial ryegrass	Cascade International Seed Co.
32	Mountain View Seed Blend 1	40% Pearl, 30% Pageant II, 30% EP57 p. ryegrass blend	Mountain View Seed Co.
33	Mountain View Seed Blend 2	40% EP56, 30% Pearl, 30% Academy p. ryegrass blend	Mountain View Seed Co.
34	Mountain View Seed Blend 3	40% EP57, 30% EP56, 30% Flash p. ryegrass blend	Mountain View Seed Co.
35	Essence	perennial ryegrass	Cebeco International Seeds
36	Top Hat	perennial ryegrass	Standard Entry
37	Cebeco Blend 1	33% Top Hat, 33% R2, 33% Gator II p. ryegrass blend	Cebeco International Seeds
38	Sabre	poa trivialis	Standard Entry
39	Tourstar	34% Imagine, 33% Ice, 33% Lynx p. ryegrass blend	AgriBioTech, Inc.
40	Marvelgreen + Laser	40% Palmer III, 20% Prelude III, 20% Phantom p. rye, 15% Laser poa triv.	AgriBioTech, Inc.
41	Phantom	perennial ryegrass	AgriBioTech, Inc.
42	Marvelgreen Supreme	50% Palmer III, 25% Prelude III, 25% Phantom p. ryegrass blend	AgriBioTech, Inc.