was promoted to the state parks' regional headquarters in 1982. He stayed there 13 years and was promoted to director of operations.

"Then I had the opportunity to come back to Bethpage in '95, and I've been here since," Catalano says.

Catalano says he always fancied working outside, so he pursued a career in parks and recreation. He took civil service exams to gain promotions at the state level. But hard work also helped him climb the career ladder.

"He's one of the smartest guys I've ever met," Currier says. "He's the heartbeat of the park."

It's no surprise that Catalano lives in a house on the 14th hole of the Black course. He says his job consumes much of his time.

"This is not a five-days-a-week-and-40-hour-a-week job," he says. "You can't possibly consider working in that type of fashion and hope to be even remotely successful to deal with any of the problems you need to deal with that come up on a daily basis. So the job becomes a way of life."

Catalano patrols the park in his utility vehicle during the evening. He also fields work-related phone calls at night. Others might balk at having to work during their off hours. Not Catalano.

"I guess I've convinced myself that I was born for this place," he says.

Catalano likes conferring with the courses' agronomic experts, including Currier, who Catalano says is one of his best hires.

"He's as committed and dedicated as anybody I've ever known," Catalano says. "There's nobody I know who works harder, and there's nobody I know cares more about this park."

Earlier in his career, Catalano learned about turf maintenance mostly through "the experience of others."

"I have a broad general background on turfgrass, but I don't involve myself in the daily decisions on spraying and fertilizing," he says.

Catalano says he prefers to function as the park's resource person. "It's my job to provide my staff with the resources they need to accomplish their jobs," he says.

Currier says Catalano is the most "resourceful" person he has ever met. "He gets me everything I need to do my job — personnel, money, equipment, you name it," Currier says.

Currier says Catalano has an uncanny ability to cut through the red tape, which is a little thicker at a state-run operation than it would be at a private one.

Final decisions often rest with Catalano, but he prefers to get others involved in the decision-making process. "I spend a lot of time discussing things with my staff," he says. "I try to make decisions on a consensus basis. I don't go out there and tell people what to do."

Catalano marvels at what Bethpage has become. The place is always packed with golfers. Tee times have been sold out since 1958.

"There is a fluctuation in rounds, but that fluctuation is either driven by weather or operational schedules," Catalano says.

Catalano is thrilled that golfers from all walks of life can come to Bethpage and play the A.W. Tillinghast-designed Black course for a mere $50 during the week and $60 on weekends if they are state residents. Green fees at the other courses are even more affordable.

"It's the best bargain in the game of golf," Catalano says. "There's a lot of satisfaction in watching people come to this place, enjoy this place and recreate in this place."

When the Black Course hosted the U.S. Open in 2002, it was the first time a public course of its stature had hosted the tournament. Bethpage spent millions on the Black course and the clubhouse to ready it for the Open. It was such a success that the course was awarded another U.S. Open.

"Looks like I'm fortunate enough to have it twice in a lifetime," Catalano says.

So, what does a guy who says his job is "a way of life" do for fun? Occasionally, Catalano goes fishing or bowling. He also collects football cards. But his job is where his heart is.

"It's fun," he says of his work.

It's hard for Catalano to believe that so many years have gone by.

"I remember when I was the youngest guy on the staff," he says. "Now I'm the oldest."

Catalano has no desire to retire, but he's thinking about it. He turns 60 in September. The 2009 U.S. Open could be his swan song.

"I love this place," he says. "I'm fortunate to be here."

Bethpage is fortunate to have him. "He's an icon for this state park," Currier says. ■

"I love this place. I'm fortunate to be here."

– DAVE CATALANO

Setting up for

These kids are good, but resist the temptation to trick up your golf course for tournaments

BY DAVID FRABOTTA
SENIOR EDITOR

Above, Nicole Schachner sends her drive down center fairway.

Junior golf is growing up. About 400,000 new juniors picked up the game last year, according to a National Golf Foundation participation study released last month. Almost 5 million kids ages 6 to 17 play the game in the United States, and the number of junior golf tournaments at the local, state, regional and national levels have swelled in line with the heightened interest.

It's big business. And considering the popularity of growing-the-game initiatives, including Link up 2 Golf, The First Tee and Play Golf America, the niche is likely to flourish.

Subsequently, superintendents are likely to see more junior tournaments and outings. That begs the question: How should the golf course be set up? The answer is not much differently than that of everyday play. That is, resist the temptation to defend your golf course by growing out the rough too much or making the greens excessively slick.

"It's better to embarrass the course than the players," says Frank Jemsek, operator of Cog Hill Golf Club in Chicago. "So we do not change the course. Everyone wants to think that their course is not a pushover, but tournaments are supposed to be fun."

Jemsek started hosting junior tournaments at Cog Hill in the late 1980s. When an experienced tournament director helped him shorten nervy par-5s into 300-yard holes, Jemsek starting thinking, "Gosh, some kids are liable to break par."

That's the natural mentality of any operator who is proud of his golf course. But Jemsek eventually understood that elite juniors play by a different set of rules at the national level. At the local level, most kids are playing for the experience.

"Once you're converted, you become a very strong proponent of trying to make it more like an outing than a tournament," he says.

The outing mentality means that Cog Hill uses the forward tees when possible. If the holes are too long to use the forward tees, then

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Kids' Play

the crew finds a flat spot in the fairway for the teeing area. The unusual setup requires excellent signage and sufficient course markers to avoid slow play.

"If you have prominent markers on the first tee, then the players will be accustomed to looking for them throughout the course," Jemsek says.

Difficult pin positions can contribute to a painful pace of play as well. If you're choosing your own pin positions, Jemsek says its tolerable to have a couple challenging ones, but "tough pin positions are the slowest days of the week, so I would lobby against really difficult placements."

If a tournament company or association is organizing the event, then they're likely to select pin positions for consistency between days and multiple sites.

The American Junior Golf Association (AJGA) is one of the tournament organizers that prefers to pick the pin positions for each day for consistency — typically six hard, six easy and six moderate locations each day.

And although many of the AJGA's players are scratch golfers in the upper ages, the association refrains from making the pin locations or green speed too challenging, partly to let the kids play against each other instead of the course and partly to preserve the turf at the 75 locations that host AJGA events each year.

AJGA typically requests greens speed of 9.5 to 11 on the Stimpmeter, again because the association doesn't want conditions to threaten the health of turf. "If they can safely get their green speed to 10, then that's great," says Mark Oskarson, director of operations for AJGA. "We don't want to leave and have their greens burn up."

The AJGA tries to implement that low-impact philosophy throughout the management of its tournaments. Oskarson says he realizes that different golf courses have different capabilities with their staffs, so tournament directors will sit down with superintendents to talk about tee times, weather delays, mowing schedules and irrigation practices.

The maintenance coordination is the hardest part, considering some tournaments have a shotgun start at 8 a.m.

"Some staffs that we work with have the ability to mow tees, greens and fairways every day before play, but they might not have the budget for it," Oskarson says. "So perhaps we

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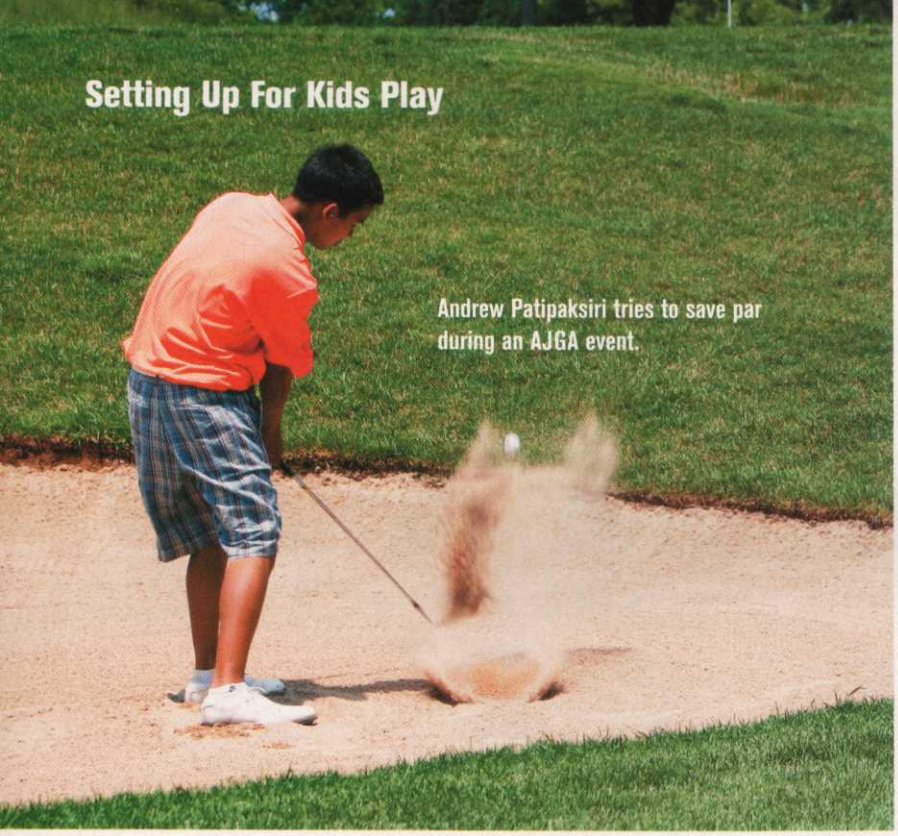
Lady juniors take a breather after a little bit of turf maintenance at Mission Hills Country Club as part of the Care Fore the Course initiative.

Setting Up For Kids Play



Andrew Patipaksiri tries to save par during an AJGA event.

Continued from page 53

might ask that greens and tees are mowed each day, but fairways might not get done until after play or only twice during the week."

The AJGA also consults with the superintendent and irrigation technician when marking teeing areas, placing signage throughout the course and marking pin locations with grass-deadening paint. And the organizers give the superintendent a radio so he or she can stay in the loop with last-minute changes or emergencies.

"After the tournament, we want the superintendent to say: 'Having the AJGA here made for the easiest tournament that we've ever had,' " Oskarson says. "We try to be as self-sufficient as we can, so we're going to take a lot of steps, like marking the golf course ourselves."

Some more sophisticated regional tournament organizers will help with course setup as well. The National Junior Golf Club, a tournament organizer in Belmont, N.C., works closely with superintendents to make sure the course is well marked for out of bounds, hazards and ground under repair, as well as intricate signage for teeing areas.

The National Junior Golf Club holds tournaments for children as young as 5 years old. The company has grown from a 12-tournament company in 1999 to hosting about 130 tournaments throughout the Southeast this year.

"We put the 5- to 7-year-olds about 125 yards out on the par 4s; we'll move them just over the hazard on the par 3s, and we'll move the par 5s to around 200 yards," says company founder Allen Wiggins. "We'll give them caddies and really try to let them have fun."

In contrast, AJGA members and The Junior PGA of America players are typically 12 to 18 years old, and they play from the tips.

The boys' setup plays about 6,800 yards to 7,100 yards, even stretching to 7,300 yards for some invitationals. The ladies play between 6,000 yards to 6,200 yards, which sometimes stretches longer than the member tees.

These kids are good.

"It's truly the Junior PGA for the upper 25 percent," says Mark Jordan, certified golf course superintendent at Westfield Country Club, which hosts the Westfield Junior PGA Championship for the seventh-consecutive year in July. "And for some, it's the highlight of their golfing careers. So we want to make it a life experience for everybody who plays."

Jordan says the club has tried to peak conditions for the tournament in the past by double cutting greens and fairways each day and growing out the rough. But there's a risk. Agronomically, turf stress can hinder conditions for the rest of the short Ohio playing season. But more worrisome, staff stress can burn out an already-weary crew.

That's why volunteers are crucial to any tournament, especially one that might qualify as a minor's Major. More than 300 club members, community residents and Westfield Insurance Co. employees volunteer to be everything from marshals to bunker rakers during the four-day event.

But volunteers aren't the only turf newbies on the course.

Many of the players cruise around to help repair turf after their competitive rounds thanks to a new initiative called Care Fore the Course.

A collaboration of the AJGA, PGA of America and the Golf Course Superintendents Association of America, players attend Care Fore the Course classes that teach players about etiquette, turfgrass maintenance and occupations in the golf industry.

After the tournament, players help replace divots, sand the driving range and repair

"It's truly the Junior PGA for the upper 25 percent. And for some, it's the highlight of their golfing careers."

–MARK JORDAN
WESTFIELD COUNTRY CLUB

ball marks as part of the initiative, which also helps "leave the golf course as good or better than when we found it," Oskarson says.

The superintendent plays a big part in the program by addressing players about conditions, golf course background, the grass types, the prevailing winds, the sand type, course layout, strategy and how all the conditions might affect play.

Superintendents also expose them to environmental benefits of green spaces for the community; environmental stewardship of lakes, streams and rivers; and preservation initiatives.

In the process, many kids are likely to recognize possible occupations in preservation, golf course architecture, landscaping and turfgrass maintenance.

"Not all of these kids are going on to the tour," Oskarson says. "So it might trigger a light in someone's head sitting in the crowd, and it could be a really neat way to stay involved in golf."

In the end, junior tournaments serve several functions, including growing the game by creating an emotional bond with the sport and a host facility. And the playing conditions are an extension of the way kids remember a golf course, just like adult golfers.

That's why planning for the little touches — painting cups and benches, edging bunkers and planting or maintaining flowerbeds — can leave a lasting, positive impression with players and the gallery alike.

"There is not one set recipe to having a successful event," Oskarson says. "Every event takes on the personality of the facility, and every event has the ability to be great." ■

Tournament To-Do List

Prior to play:

- Drag fairways in the event of heavy dew.
- Mow greens and tees.
- Position water or donated beverage on each hole.
- Relocate ball washers, benches, beverages and trash to appropriate teeing grounds.
- Remove ropes, stakes and directions signage so tournament director can re-mark the course to set specifications.
- Place rakes outside bunkers.
- Place extra trash receptacles in appropriate locations.
- Identify a place for a pairings box.
- Identify appropriate areas for scoring tent and administrative tents; secure extra tables and chairs for these areas.
- Provide maps of the course to players and administrators.
- Borrow or provide squeegees in the event of adverse weather.

Source: American Junior Golf Association

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TURFGRASS TRENDS

SUBSURFACE DRIP IRRIGATION

Establishing Bentgrass Can Be Difficult With Subsurface Irrigation

By Justin Weeaks, Richard Zartman and Michael Maurer

Water limitations all across the Southwest have placed increased demands for water conservation on golf courses and other recreational fields. Most superintendents irrigate courses using over-the-top sprinklers. An alternate method to the over-the-top sprinkler irrigation could be using subsurface drip irrigation (SDI).

SDI can be more effective at irrigating difficult areas, areas of excessive slope and those areas prone to damage or vandalism. SDI has been investigated in native soils, but little is known about how it will perform in high-sand rootzones.

A series of greenhouse experiments were conducted at Texas Tech University to determine the ability of seeded bentgrass to establish using SDI in high-sand rootzone mixes. Several commercially available products were used as amendments, including two porous ceramics products (Profile and PermO2Pore), peat moss and Western Pozzolan.

Materials and methods

Golf sand from a local source was used to mix with the various additives. Products were mixed at different levels for the two studies. Each study used four rates (10, 20, 30 and 40 percent by volume) of each product. A second study had an additional treatment of native soil. It was mixed at 20, 40 and 60 percent by volume. A control of pure sand with a gravel layer was used. Products were mixed thoroughly to ensure adequate incorporation and uniformity.

Rootzone mixture was poured into a 5-gallon container with a 3-inch layer of gravel in the bottom. The 5-gallon container contained drainage holes to facilitate drainage. SDI tubing was buried 6-inches deep. Holes were drilled on the side of the containers, and the tubing was inserted. Tubing emitter was placed in the center of the container. SDI system was installed as a loop and grid design. The system was irrigated with Lubbock, Texas, municipal water.

Once rootzone mix had been added to containers, the containers were seeded with Dominant Plus bentgrass at 1.5 pounds per 1,000 square feet. The seeds were lightly watered from over the top to settle the rootzone mixture. After this initial hand watering, no additional over-the-top irrigation was applied. SDI ran for several cycles every day until germination began. Watering then was scaled back according to daily needs. Stand was allowed to grow for six weeks after seeding.

Weekly observations were taken on percentage coverage, and weekly water content using a theta probe to a depth of 8 inches was collected. At the conclusion of the

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six-week study, each treatment was harvested for biomass and sampled for root depth.

Results

In many of the treatments, bentgrass seeds failed to germinate during the study. Others treatments did produce a stand, but were quite low in percentage coverage and lacked a desirable uniformity. Table 1 shows data at the end of the study.

In Experiment 1, Western Pozzolan at 20 percent and peat moss at 40 percent had the best coverage compared to the control of only 19 percent. Peat moss at 40 percent clearly had the highest biomass at the end of the study, but most of the growth was centralized in the center of the container, directly over the emitter. This caused a lack of coverage from edge to edge of container. But Western Pozzolan at 20 percent had much greater total container coverage even though it had significantly less biomass accumulation.

In Experiment 2, Western Pozzolan at 40 percent and native soil at 60 percent had the greatest coverage at the end of six weeks. Control actually did better than any of the porous ceramic products. The only peat moss treatment that did exhibit any germination was 10 percent with a coverage of only 15 percent. There were no differences in rates in Western Pozzolan treatments, and the only difference in rates for native soil was in 60 percent.

Summary

Treatments such as the porous ceramic products and peat moss at low rates in these studies failed to exhibit any germination.

While many products did produce some germination, none achieved 100-percent coverage. Peat moss never achieved good germination. This could be in part that when the surface became dry, the SDI from below could never rewet the surface. During the course of the study it became apparent early on which treatments would most likely fail in germination due to a lack of continual wetting at the surface.

In the bentgrass seeded treatments that did germinate, it was often by using a very high rate of additive (e.g. peat moss, native soil). Using high levels of additives is not only undesirable but also financially impractical. The use of additives can increase the cost for construction significantly.

TABLE 1

Experiment Means at Six Weeks

Experiment 1		
Treatment	**Cover (%)**	**Biomass (g)**
WP 10	43.3	1.43
WP 20	50	1.63
WP 30	33.3	1.3
WP 40	13.3	0.73
GR 10	35.5	0.56
GR 20	5	0.1
GR 30	5	0.1
GR 40	5	0.1
PM 10	0.3	0.2
PM 20	40	2.7
PM 30	18.3	1.6
PM 40	50	5.6
Control	19	0.86
Experiment 2		
Treatment	**Cover (%)**	**Biomass (g)**
WP 10	53.3	0.16
WP 20	36.6	0.2
WP 30	40	0.2
WP 40	58.3	0.43
GR 10	12	0.1
GR 20	7	0.1
GR 30	4	0.13
GR 40	1	0.1
PP 10	16	0.1
PP 20	18	0.1
PP 30	11	0.1
PP 40	14	0.03
PM 10	15	0.07
PM 20	0	0
PM 30	0	0
PM 40	0	0
Native 20	11.6	0.13
Native 40	45	2.13
Native 60	65	0.93
Control	35	0.1

WP=Western Pozzolan, GR=Profile Green, PM=peat moss, PP=PermO2Pore, Control=pure sand, no additive.

Since this project, there have been other experiments conducted to enhance germination. At this point more research must be conducted to determine whether SDI is feasible to establish bentgrass on high-sand rootzones.

Justin Weeaks is a doctoral student at Texas Tech University majoring in turfgrass science. His master's degree concentrated on seeded bermudagrass establishment using subsurface drip irrigation.

Dr. Richard Zartman's research interests are in the areas of soil physics, environmental soils and root distribution.

Dr. Michael Maurer's research focuses on water use efficiency (subsurface drip irrigation), development of low-input turfgrasses and herbicide evaluation.

Bermudagrasses Show Diverse Responses to Shade

By C.M. Baldwin and H. Liu

Trees out-compete turfgrasses for light, water and nutrients. However, the response of different cultivars to shade varies widely.

Trees are not going away from golf courses any time soon. They provide shade for players; make land use more efficient by separating fairways; increase golf course difficulty; enhance aesthetic value by screening roads, cars and buildings; protect errant shots from hitting pedestrians or cars; and provide a natural wildlife sanctuary and habitat for birds (Lilly, 1999).

Regardless of the shade source, turfgrass growth and development are inhibited when plant light interception is suboptimal. An estimated 25 percent of turfgrass growth is impacted by light restrictions (Beard, 1997).

Bermudagrass (*Cynodon* spp.) decline in shade can be attributed to excessive shoot production. Beard and Beard (2005) define shade as, "a turfed or ground surface overshadowed by plant foliage such as a tree canopy or by an opaque structure; typically the interception of sunlight occurs."

When light is blocked, bermudagrass stoloniferous growth slows and vertical growth is initiated in search of sunlight. Due to this morphological change, bermudagrass depletes carbohydrate reserves and severely reduces its recuperative ability from daily mowing, traffic and divots. Cultural practices to enhance turfgrass performance in shade include raising mowing heights (Bunnell and McCarty, 2004), applying plant growth regulators (Bunnell and McCarty, 2004), and reducing nitrogen rates (Bell and Danneberger, 1999).

Bermudagrasses are the most popular warm-season turfgrass in warmer climate zones in the country (Shearman, 2006). In order to assist turfgrass managers when selecting bermudagrass for establishment or for renovation when shade is a limiting growth factor, a study was initiated at Clemson University to determine how 64 percent continuous shade impacted 42 bermudagrass cultivars' growth and development.

PHOTO 1

Visual quality comparison of TifNo.4 (left) and Tifway following five weeks of 64 percent continuous shade.

Materials and methods

This two-year greenhouse study was conducted from June 15, 2005 to Aug. 15, 2005, and repeated in 2006 at Clemson University. The study included two treatments, a control (full sun) and 64 percent continuous shade, applied daily using a neutral density, polyfiber black shade cloth.

Shade cloths were placed on a polyvinyl chloride (PVC) structure 6 feet in length and 5 feet in diameter with 1-inch diameter PVC pipes. Shade tents were placed 1 foot above the turfgrass surface to reduce sunlight encroachment in early morning and late afternoon.

Plugs were collected from the 2002 Bermudagrass National Turfgrass Evaluation Program (NTEP) (Table 3, p.64) field research plots located at Clemson University and transplanted into cone-tainers with 85 percent sand

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Enhance turf performance in shade by raising mowing heights, applying growth regulators and reducing nitrogen rates.

TABLE 1

Turfgrass quality of 42 bermudagrass cultivars after four and eight weeks of full-sun (control) and 64 percent continuous shade at the Clemson University greenhouse complex. NTEP turf quality (1 to 9).

	Turfgrass Quality				
	Week 4		Week 8		
Cultivar	Full Sun	Shade	Full Sun	Shade	Rank†
Celebration	7.5a-c‡	6.5ab	7.3a-d A	4.5a-c B	2/2
TiftNo.4	7.3a-d	6.2a-d	7.8a A	4.8ab B	2/2
TiftNo.1	7.2b-e	6.3a-c	7.2a-d A	4.3a-d B	2/2
Transcontinental	7.0c-f	6.0a-e	6.8b-f A	4.3a-d B	2/2
Aussie Green	7.5a-c	7.2a	7.8a A	5.3a B	2/2
MS-Choice	6.8c-g A§	5.8b-e B	7.3a-d A	3.7c-h B	0/2
Princess 77	7.2b-e A	5.3b-h B	6.8b-f A	3.7c-h B	0/2
SWI-1045	7.2b-e A	5.5b-g B	7.0a-e A	3.7c-h B	0/2
SWI-1041	7.8ab A	5.3b-h B	7.3a-d A	3.5c-I B	0/2
SWI-1012	7.0c-f A	5.3b-h B	7.0a-e A	4.0b-f B	0/2
Tifway	7.5a-c A	5.0d-i B	7.5a-c A	3.2e-i B	0/2
Tifsport	7.2b-e A	5.5b-g B	7.7ab A	3.3d-i B	0/2
SWI-1014	7.5a-c A	5.5b-g B	7.2a-d A	3.2e-i B	0/2
GN-1	6.2g-j A	4.5f-i B	6.2e-g A	3.2e-i B	0/2
Patriot	6.3f-i A	4.5f-i B	6.5d-f A	2.5i B	0/2
Sundevil	6.7d-h A	5.0d-i B	6.8b-f A	3.7c-h B	0/2
SR 9554	6.3f-i A	4.8e-i B	6.7c-f A	3.0f-i B	0/2
Arizona Common	5.5j A	4.2hi B	5.5g A	3.0f-i B	0/2
p-value	0.0001ƒ	0.0001	0.0001	0.0001	

† *Rank indicates number of times cultivar placed in top statistical category when grown under 64 percent shade. Greatest shade tolerance = 2/2, greatest shade sensitivity = 0/2.*

‡ *Values within a column followed by the same letter are not significantly different at P≤0.05 by protected LSD.*

§ *Values within a row within each week for turfgrass quality followed by the same letter are not significantly different at P≤0.05 by protected LSD.*

ƒ *Indicates statistical difference at p≤0.05.*

* *For a complete list of results from all cultivars, please e-mail: cmbaldw@clemson.edu*

PHOTO 2

Root biomass comparison of Celebration (left) and Tifway bermudagrasses following eight weeks of 64 percent continuous shade.

Continued from page 59

and 15 percent peat as growth media. Cone-tainer dimensions were 10 inches in height and 2 inches in diameter. Following potting, plugs were established one month prior to treatment initiation. Fertilizers were provided at 1 pound nitrogen (N) per 1,000 square feet biweekly using a complete fertilizer (16N-1.7P-6.6K). Cone-tainers were mowed 0.5 inches four times weekly with clipping removal.

Data collection was identical in year one and year two. Turfgrass quality ratings were recorded weekly based on color, density, texture and uniformity of the bermudagrass surface. Quality was visually evaluated from 1 to 9 — 1 = brown, dead turf; 6 = minimal acceptable turf; 9 = ideal green, healthy turf.

By week eight, all cultivars grown in shade had significant decline in turf quality compared to those grown in full sun.

Root biomass and length were determined at the end of the study. Roots were extracted from the soil and thoroughly washed until all soil was removed. Following soil removal, root length was measured from the base of the thatch level and recorded. Roots were then clipped from the base of thatch and dried in an oven at 176 degrees Fahrenheit for 48 hours. Once dried, samples were weighed to determine total root biomass.

Total shoot chlorophyll concentration was measured at weeks four and eight. Clippings (0.1grams) were collected from each cone-tainer and placed in a glass test tube with 10 milliliters (ml) of dimethyl sulfoxide. Samples were incubated in 149-degrees F water for 1.5 hours. Remaining extract (2 ml) was transferred into cuvettes and absorbancy values were recorded at 663 nanometers (nm) and 645 nm wavelengths using a spectrophotometer.

Each treatment was replicated three times in a randomized complete block design. All statistical computations were conducted

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