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Valeria Defex

Age: 17 **Handicap:** 6

Years active in The First Tee: Four

The First Tee was more than an activity for Columbia, South America, native Valeria Defex. The Dallas chapter was her lifeblood when the shy, intimidated 12-year-old moved to a foreign land.

"My coach says [the people at The First Tee] brought me out of my cocoon, and then I turned into a butterfly," she says. "And it's more about bringing my personality into how I interact with people than it is about playing golf."

Valeria

Defex says her friends in The First Tee have a lot of fun, above all, which is crucial for recruiting more high school kids to golf. Golf can seem stuffy, and Defex agrees more emphasis needs to be placed on the personal bonds the sport can create so more teenagers consider it an option.

Defex says teaching The First Tee participants to become mentors is another way to grow the game. "Teach us to teach," she adds. "Give us equipment and teach us how to be leaders so we can teach others."

Michael Hughes

Age: 16 **Handicap:** 30

Years active in The First Tee: Six

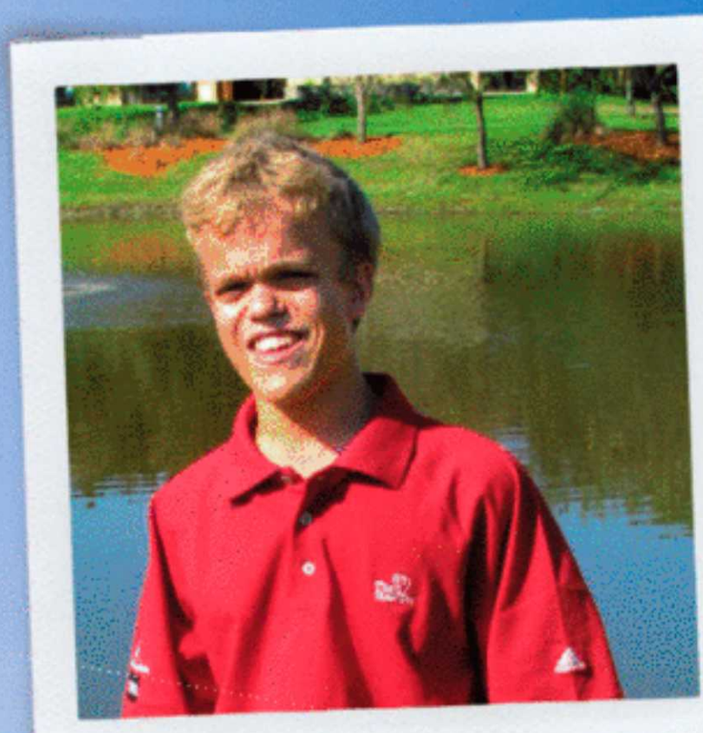
Michael Hughes' father introduced him to golf. But it was when his mom discovered The First Tee program in Cary, N.C., that Hughes began to thrive not as a player, but as a community pillar and leader.

As a little person, the deck is stacked against Hughes in many other sports, especially traditional team sports. Golf gives him an activity that he can partake without feeling like he's disadvantaged. And that reality has proved to him that he can do far more than chase a white ball around a golf course.

"I have learned that any person can do anything," Hughes says. "I might not have a future playing golf, but it's the life skills that I carry through everyday life, and I get to keep those skills forever."

Hughes says he will always play golf, but he will pursue biomedical engineering as a career so that he can help other people like him.

In the meantime, he says he'd like to help with fund raisers that create more access to the game, which he says will help grow the game among middle-class families.



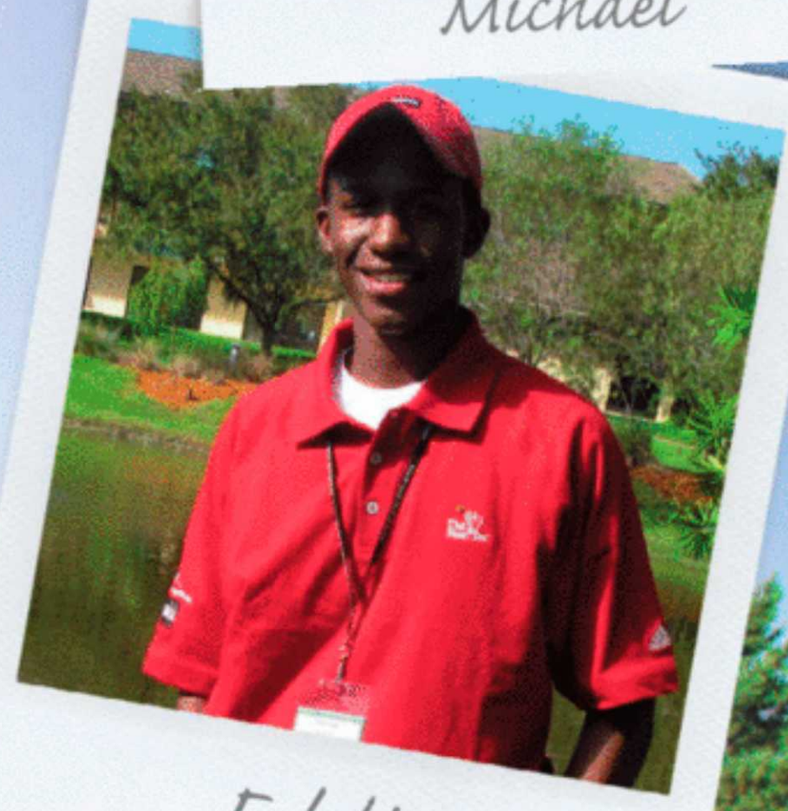
Michael

Eddie Bolden

Age: 17 **Handicap:** 9.5

Years active in The First Tee: Four

Eddie Bolden, a member of The First Tee of St. Louis, says he was lucky to be introduced to golf at 9. If he had waited until he was a teenager, Bolden says he might never have started playing because "golf is not a well-recognized sport in the African-American community."



Eddie

Although Bolden says he's fortunate to have been introduced to the game, he considers himself even more fortunate to be able to afford it because of programs like The First Tee. Golf can be expensive, which can detour many young people from playing, Bolden says.

Bolden also prefers golf over other sports because it brands itself as a gentleman's game.

"Golf is about honesty; it's about core values that are more important than winning," he says.

One of those core values is mentorship, which is an important element of The First Tee. That's crucial to growing the game because the earlier people start, the more likely they are to continue.

"Everyone who plays golf ends up saying the same thing: 'I wish I would have started playing when I was younger,' " Bolden says. ■

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TOP Assistants

Josh Kelley loves the challenges that a new day brings

Editor's note: If you'd like to nominate someone for the Top Assistants feature, please send an e-mail to Larry Aylward at laylward@questex.com.

Grande Pines Golf Club Certified Superintendent Chris Flynn calls Josh Kelley "the best assistant I've ever had."

That's quite the compliment for Kelley, a graduate of Illinois State University, whom Flynn hired more than two years ago to work at the Orlando course.

"Josh is highly regarded both here at our resort, and with our company, Marriott Golf," Flynn says. "One of his biggest achievements thus far was that he single-handedly earned Grande Pines the distinction of being a Certified Audubon Sanctuary last year. This required a tremendous effort to which he was successful."

Flynn says Kelley, who has a degree in turfgass management, is "well beyond his years and is on his way to becoming a superintendent here in the near future."

Kelley says when he worked as a groundskeeper at Panther Creek Country Club in Springfield, Ill., he became "hooked" on the profession. He then switched degrees and schools to study turfgrass management.

Golfdom caught up with Kelley to talk about the profession he loves.

What's your favorite part of the job?

Knowing that every day is going to bring new challenges and opportunities. No matter how well the course looks or plays, there are always improvements to be made. Managing and maintaining a golf course requires a lot of problem solving, planning and prioritizing, all things I enjoy.

Who has been the biggest influence on your career and why?

The work ethic that my father and grandfather instilled in me allowed me to progress quickly in my career. That, accompanied with being able to spend time with top-notch superintendents throughout my career, has definitely made me the superintendent that I am today. Chris Flynn has especially influenced me. After hiring me, he immediately empowered me to make decisions, allowed me to question him and took the time to listen to my suggestions, which allowed me to learn and grow.

What's your favorite product or piece of equipment and why?

The Toro Flex 21 greens mower. Grande Pines Golf Club has some severe undulations in our greens, which have always caused some problems with scalping in certain areas. This past fall we leased all new Toro Flex 21 greens mowers. The use of these mowers has almost completely eliminated the scalping.

If you could change something about the industry right now, what would you change?

The perception that all golf courses should be "TV perfect." We have Tifeagle and Tifsport bermudagrass, which does not go dormant in central Florida unless we have a severe cold snap. So we only overseed our tees and greens. We get some complaints for not being as aesthetically pleasing as some of the wall-to-wall overseeded courses in the area, but lower-handicapped players tend to like our course better because of the faster and firmer conditions we can provide from not overseeding.

How would you describe yourself in one word?

Reliable.

What is your favorite hobby and why?

Photography. When I started college, I majored in graphic design with a minor in photography. Following my sophomore year, I switched schools and majors but I've always kept a camera nearby.

What's your favorite vacation spot?

I don't know that I have a favorite spot. This past year I was fortunate enough to visit Oregon, Colorado and the Bahamas. All were great in their own ways.

What's your favorite golf course besides your own?

TPC Deere Run in Silvis, Ill. I worked there in 2005. It's a great piece of property. The course is carved out of the forest along the Rock River and has various elevations. This is in great contrast to the plains and cornfields typically associated with Illinois.

It's your last day on Earth. What do you do?

Sleep in. Get all of my friends and family together and play a round of golf. Then have a nice barbeque. ■

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Golfdom'S PRACTICAL RESEARCH DIGEST FOR TURF MANAGERS

TURFGRASS TRENDS

EFFLUENT IRRIGATION

Problems Surface with Effluent Use on Turf in the Southeast

By Thomas Rufty, Danesha Seth-Carley and Lane Tredway

Population increases in the southeastern United States are creating new challenges for turfgrass managers. An important one is the expanded use of sewage effluent as a water source.

Unknown to most people, the main driver for increased effluent use is the need to disperse sewage effluent. Concerns about water quality have led to policy decisions within the Environmental Protection Agency and state regulatory agencies to restrict direct discharge of sewage effluent into surface waters. Increases in sewage effluent must be applied to the landscape. This is true whether effluent is generated by expansion of municipal waste treatment plants or by construction of local waste treatment facilities that serve individual communities. The expected protection of water quality will result from uptake or filtering of pollutants by the vegetation and dilution of escaped pollutants in the large body of groundwater.

Turfgrass systems are the ideal effluent dispersal sites. Effluent contains high concentrations of pollutants such as nitrogen and phosphorus. Turfgrasses can efficiently take up these plant nutrients and act as a natural filter for the environment. Also, golf courses, athletic fields, parklands and home lawns are where large acreages can be found and irrigation systems are often in place. From the turfgrass industry side, effluent can be an important water source for irrigation. Effluent has been used for many years to irrigate recreational turfgrass areas in the southwestern United States, California and Florida (cf. Harivandi 2004).

Even though sewage effluent applications to turfgrasses seem an ideal fit, a number of problems have been cropping up in the southeastern transition zone, which includes North Carolina and much of South Carolina. This zone is where warm- and cool-season grasses are at the limits of their adaptation and have seasonal growth patterns. The region is also experiencing very rapid population growth and, as a consequence, generation of sewage effluent is rapidly increasing.

The problems can be traced to the climate in the transition zone. Warm-season bermudagrass is most often the grass type growing on the large acreages at golf courses and recreational sites used for effluent dispersal. Water use by the bermudagrass system and potential evapotranspiration (pET) coincides with high temperatures and high bermudagrass growth rates in the summer. The problem is that summer is also the time of year when rainfall is greatest.

From the bermudagrass growth, pET and rainfall profiles, one can quickly see

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Turfgrass systems are the ideal effluent dispersal sites. Effluent contains high concentrations of nitrogen and phosphorus.

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the complexity involved with effluent dispersal. Because pET never greatly exceeds rainfall, effluent dispersal is primarily limited to time windows between rain events in summer months. The seasonal dispersal then has a domino effect, necessitating substantial storage capacity for effluent during winter months. And if there is a particularly rainy year with unusually high rainfall in summer, then the storage capacity must be adequate to accumulate effluent from one year to the next.

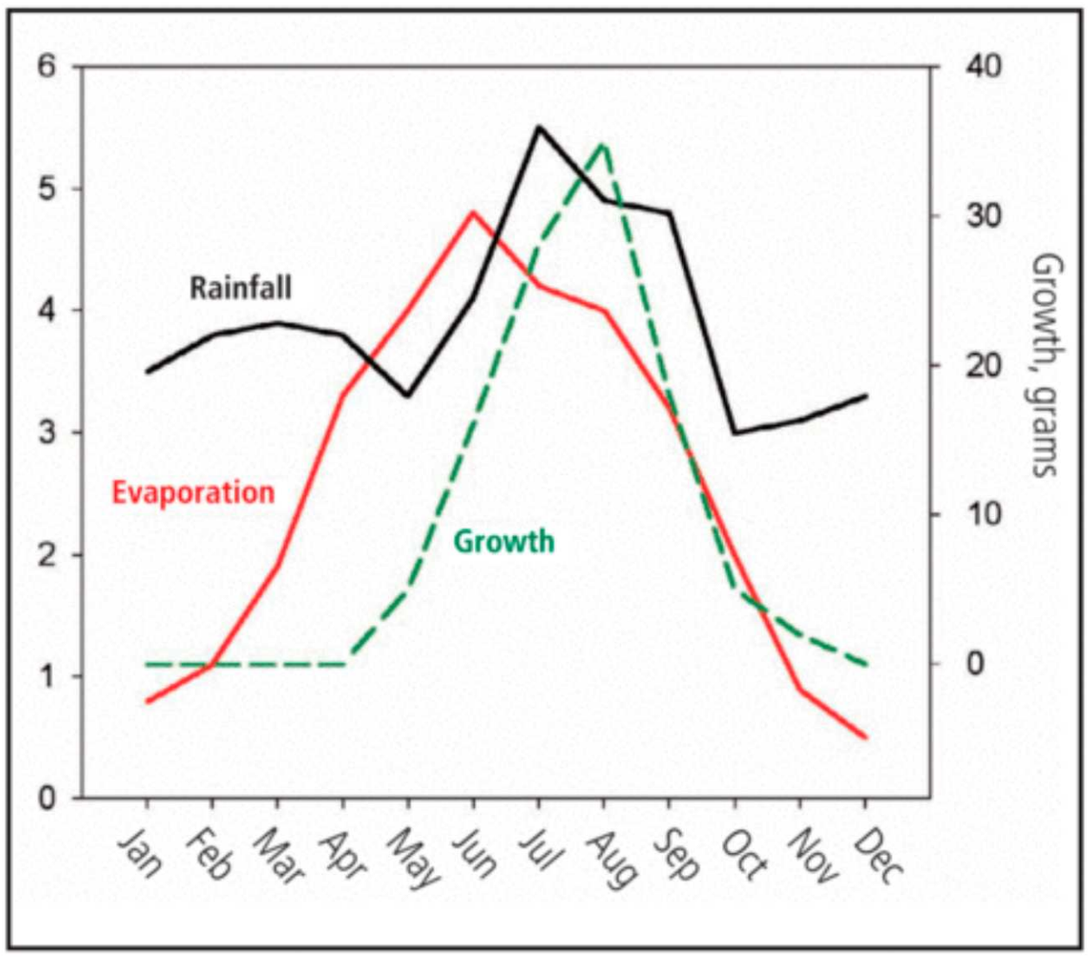
So, one might ask, who cares about pET and water use by bermudagrass? Why not view a golf course like a backyard drainage field? Apply effluent year round and let it go downward through the soil. Even if pollutants are not filtered, they will be diluted in groundwater as intended. Well, as it turns out, water infiltration on golf courses also can be a problem.

Fine-textured, clay soils are pervasive in the transition zone (Buol et al. 2003). They become compacted during construction, and contours often involve cuts deep into the subsoil or "B horizon." In either case, soils have very low hydraulic conductivities. Even with sandy soils in the region, soil compaction often occurs as a result of heavy equipment traffic (Naderman 1990). Much research has examined compaction in agricultural soils in the area (Gent et al. 1984). It is known that a penetration resistance of 20 to 30 kilograms per square centimeter (kg/cm^2) restricts downward root growth and creates a perched water table. Under bermudagrass fairways, we have found a layer of resistance up to 50 to 70 kg/cm^2. With the very low rates of water infiltration, only small amounts of effluent can be added at any one time and fairways stay wet, and playability declines noticeably with repeated applications.

The limited capacity for effluent dispersal on golf courses often leads to strained relations between superintendents and developers. To obtain permits for a planned community, developers now must demonstrate to regulators how the resulting effluent will be dispersed. In new golf course communities located in fast-growing metropolitan areas, sewage is processed in community or "package" treatment plants and dispersed on the golf courses. The environmental impacts are controlled on site. However, to ensure the maximum numbers of lots are approved, it is not unusual for developers to obtain effluent dispersal permits committing to unrealistic dispersal amounts.

Superintendents generally like access to effluent water because it provides a safety cushion during droughts. But they want the amount of effluent required for irrigation, nothing more and nothing less. We have examined transition zone rainfall over the past 50 years in detail, and estimate that about 20 to 25 million gallons of effluent can

PHOTO BY: MIKE KLEMME



Profiles of rainfall, evaporation and bermudagrass growth in central North Carolina. Estimates for rainfall and evaporation are from 60-year climate data obtained from the Southeastern Regional Climate Center in Chapel Hill, N.C. Note that maximum rainfall and evaporation occur in late spring and summer, limiting net potential evapotranspiration and making effluent dispersal difficult.

be dispersed on an 18-hole golf course with 80 acres of bermudagrass in a normal rainfall year. Nonetheless, effluent permits have been issued that commit to dispersal of as much as 100 to 150 million gallons a year.

There is nothing subtle here. The requirement for effluent dispersal on the landscape and unrealistic permit levels are putting superintendents in a bind they cannot resolve. Developers are often their bosses, so the superintendents have to work with the situation as best they can. Unfortunately, the excess water problem worsens with time as communities build out. Over-extended state regulators are not ordinarily the solution to the problem, because they often view golf courses as waste disposal sites. Wet fairways are not an issue for them.

The appropriate solution to the effluent problem is setting aside larger acreages for landscape dispersal. Enough additional land must be available for dispersal even in wet years with high rainfall. Non golf course land would be expected to have higher infiltration and thus greater water loading capacities per acre. Of course, there are problems even with this obvious solution. High land prices accompany high population growth, so extra land set-asides or purchases can hamper potential profits. Regardless of whether extra land is available, the bottom line is that golf courses should not be locked in to accepting any minimum amount. They would use only the amount of effluent they need for normal irrigation purposes.

Unfortunately, there are problems with effluent dispersal on golf courses in the transition zone in addition to excess water applications. Two of the main ones are degradation of bentgrass quality on putting greens and difficulties with irrigation system operations. We will explore those issues in an upcoming article in Turfgrass Trends.

Tom Rufty is professor in the departments of crop science and plant biology at North Carolina State University, where he is also co-director of the Center for Turfgrass Environmental Research and Education. His current research program investigates turfgrass/environment interactions. Danesha Seth-Carley is senior researcher in N.C. State's department of crop science. Her research centers on environmental stress effects on turfgrass species and the resulting susceptibility to soil-borne diseases. Lane Tredway is associate professor and turfgrass extension specialist in the department of plant pathology at N.C. State. His research includes evaluation of environmental conditions leading to disease infestations in turfgrass systems and relevant control strategies.

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Understanding Microbes Helps Explain Nutrient Cycling

By Dan Lloyd, Doug Soldat and Teri Balser

As urban areas continue to expand into the rural landscape, agricultural land is converted to turfgrass cover in the form of golf courses, parks, athletic fields and lawns. With urbanization expected to increase 79 percent in the United States over the next 25 years (Alig et al, 2004), turfgrass ecosystems inherit an even more prominent role in urban nutrient cycling, water management and carbon interactions.

Previous research has examined nutrient use and carbon sequestration by turfgrass and other natural and agricultural ecosystems. However, little is known about the tiny creatures that orchestrate these processes: soil microorganisms. The study of soil microorganisms is difficult on a number of levels. First, we can't see them, so they are out of sight and out of mind. Second, most methods for studying these critters are rife with difficulties. Third, while we can identify thousands of different species, we only really know what a small percentage of them are doing in the soil. In short, we have a lot left to learn. By understanding what microbes are doing and under what conditions they dominate, we can learn more about how to improve nutrient and organic matter cycling in turfgrass areas.

Soil microorganisms have an enormous influence on plant-soil interactions crucial for maintaining healthy turfgrass. Perhaps the most important of these interactions is the cycling of nutrients, especially nitrogen. As much as half of applied nitrogen fertilizer can be consumed by the microbial community within three days. This immobilized nitrogen is only temporarily unavailable to the plant and is re-released, or mineralized, over time depending on climate and soil properties along with the demographic and activity of the microbial pool. Substantial amounts of both soluble and slow-release nitrogen fertilizer sources undergo several transformations between ammonium, nitrate and organic nitrogen before finally being absorbed by the plant. Soil microorganisms are the behind-the-scenes facilitators of nitrogen immobilization, mineralization and transformations in the soil.

Organic matter accumulation is another turf-management issue of particular concern to golf course managers because of its significance on playing conditions. Once again, the rate of organic matter degradation and accumulation is dependent on the population and activity of the soil microbial community. With such important roles in these fundamental processes in turf management, an increased understanding of this active and complex population could enable turf managers to use these soil microbes to their advantage. Understanding and potentially manipulating this community could have significant implications on turf-management strategies.

Studying soil microorganisms is notoriously difficult, and there are several different methods that can be used, each with their own inadequacies. The method we used to study the multitude of microorganisms in the soil was to identify them by their unique fatty acids (PLFA-FAME analysis) and then lump the individual species into broadly defined groups. We can then study how the groups dominate in different environments. To obtain a representative sample, we collected soil samples from 42 turfgrass sites in southern Wisconsin. We then analyzed the soil to see the relative distribution of the various functional groups and then compared the functional groups to the soil properties. The groupings, or functional groups, of microorganisms are listed here:

- Gram positive bacteria (GPB) have a rigid cell wall and are tolerant of stressful conditions. These bacteria are usually dominant in extreme environments, and can form spores and remain in a dormant condition until favorable growing conditions return.
- Gram negative bacteria (GNB) have weak cell walls and require a "biofilm" to survive. These bacteria are important for all aspects of the nitrogen cycle (immobilizing,

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