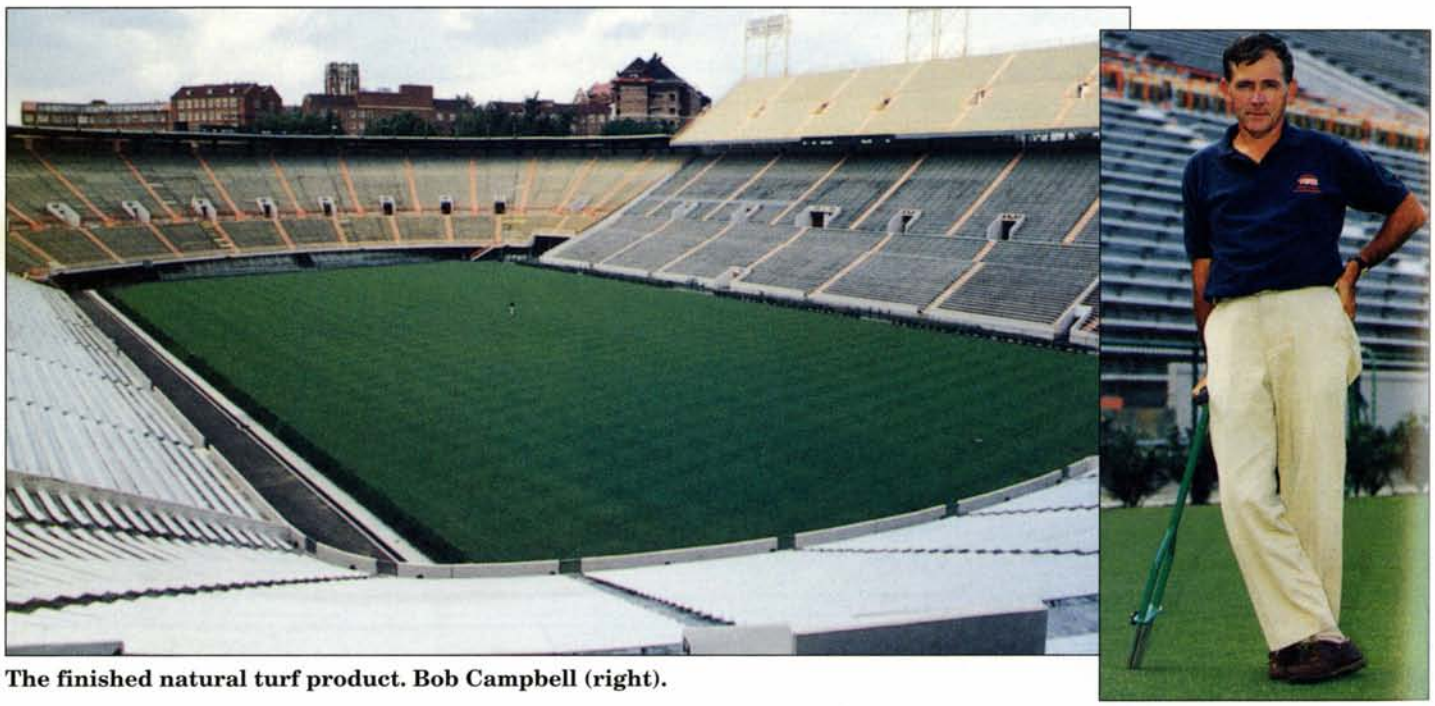
New Wave:

CAMPBELL GUIDES TENNESSEE BACK TO NATURAL TURF



The finished natural turf product. Bob Campbell (right).

By Bob Tracinski

The University of Tennessee's Neyland Stadium, home of the perpetually nationally-ranked football Volunteers, was converted to artificial turf in 1968. At that time, artificial surfaces for sports activity were "the wave of the future," deemed more playable, better for the athletes and less costly to maintain. Knoxville's University of Tennessee was the first outdoor stadium to make the move.

Over the years, several new "rugs" were required to keep the surface in good condition. As the time approached to replace the rug yet again, a swell of support arose for the switch back to natural turf. Rumors surfaced that other schools were using the artificial playing surface as a negative factor in recruiting against UT Coach Phillip Fulmer. Where once the student athletes' "perceptions" of top playing conditions were reflected by the school's artificial turf, that same surface now appeared to be coloring potential athletes' "perceptions" of where they should invest their playing skills.

Obviously, the decision to convert a high-profile, heavily-used artificial surface to natural turf is not undertaken lightly.

Also obvious is the fact that Bob Campbell, assistant director of athletic facilities at the University of Tennessee, takes no part of his responsibilities lightly. Bob Campbell does his homework. He believes in research, fact-finding, probing, questioning, checking and rechecking, seeing what works, finding out what doesn't work, and always seeking the "WHY" behind the results.

Campbell joined the UT staff in 1990 with a strong sports-related background. In the early 1970s, Campbell attended the University of Tennessee and served as an assistant baseball coach. After graduating with a degree in accounting, he taught at the high school level and, for 16 years, he coached both baseball and football. As is the case in many high school situations, Campbell served as his own groundskeeper to get and keep the best possible playing conditions for his student athletes.

Ten years ago, he quit the coaching scene in favor of a groundskeeper position with a AA baseball franchise. During this period, he was still a full-time teacher. Finally, the challenge of groundskeeping at the university level drew him to his current position with the University of Tennessee.

Campbell says, "This is the big time. Tennessee has no professional-level football. Neyland Stadium is filled to the full 95,000 capacity for every home game, and every eye and ear in the state focuses on our team. It doesn't get any bigger than this."

As a dedicated alumnus, Campbell had been monitoring the artificial versus natural turf situation prior to making the move. Once on board, he dug into this homework in earnest. "I knew a decision would be made, and I wanted to have everything ready to move if we did go to grass," he asserts.

Typical of Campbell's style, he sought input from Dr. Tom Samples, turfgrass

Nutri-Turf sprigged Neyland Field with Tifway 419 (top). The rootzone consists of 90% sand and 10% reed sedge peat. Neyland Stadium in days of artificial turf (right).

extension specialist for the university. Samples became not only a top researcher on the project, but also what Campbell calls "my personal tutor and mentor. There's so much more that can be covered by working one-on-one with Tom than I could ever get in a classroom setting. Besides, Tom has this knack of taking the most complex technical output and translating it into 'real-world' terms. And it's never, 'you must do it this way' - it's 'if you adopt these methods, these are the probable outcomes - if you adopt those methods instead, those are the probable outcomes.' The decision is mine to make based on the best technical input available."

"Before a natural field could be considered seriously, we had to determine whether the stadium site could support turf growth," says Campbell. "Neyland Stadium had been expanded after the artificial field was installed. The steep configuration of the existing structure blocks sunlight from much of the field for relatively long periods. Dr. Joanne Logan and her class conducted a concentrated shade study with computer models and related field tests to determine the exact shade levels and the degree of shade to which all sections of the field were subjected throughout the year. After reviewing the data, Dr. Samples' conclusion was that, while the situation was not ideal, we could grow grass. Then we tackled the other concerns in earnest."

Campbell's approach to determining what kind of field could and should be built again was typical. He began checking ALL of the options. "I read everything I could get my hands on," he says. "I visited as many different stadiums as I could and talked to the grounds managers there. I attended the national Sports Turf Managers Association meeting in Indianapolis. And I asked everyone a series of questions: "What do you like about your field? What don't you like about it? What would you do differently if you were to build it now, from scratch, with no constraints? And to all the answers I asked WHY."

Campbell expanded his list of advisors, adding Dr. Coleman Ward of Auburn University, Dr. Gil Landry of the University of Georgia , Dr. Lloyd Callahan of UT, Dr. A. J. Powell of the University of Kentucky, and a contact from the STMA meeting, Chuck Dixon, president of technical operations for Turf Diagnostics and Design, Inc., Olathe, KS.

Campbell is a great listener. He made notes of who did what and why. Then he ran all of that information by Samples to get his input and to help generate more questions.

Campbell's information base was drawing him toward the USGA-greens-specification type of field. He quizzed Dixon on field construction and especially on the field the company had helped develop at the University of Florida in Gainesville. With five years of history, this field was holding up well and had met with apparent approval from its coaches, players and grounds-care staff.

But naturally, Campbell didn't stop there. He made a site visit to Gainesville, talked with Mike Powell and other people there himself and asked his series of questions.

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"With all the positive input, it was the consensus that if the move was made to natural turf, a USGA-greens type field was the way to go," Campbell continues.

In the spring of 1993, Coach Fulmer and Athletic Director Doug Dickey officially made the decision to convert the field to natural turf. Then Campbell provided his recommendations on the type of field that should be built. At this stage, and throughout the entire project, "Support within the University has been great. Everyone was behind this conversion and did everything they could to ensure its success," Campbell maintains.

Campbell can't say enough about his staff. "Head Groundskeeper Myron Roach is tops," he insists. "With our established fields and practice fields, I just make sure the staff has the materials and equipment they need to work with and stand back and let them make me look good. We have three full-time and three part-time personnel assigned to the athletic fields and there's not one of them I'd even consider trading for anybody else's grounds crew. This field conversion and the ongoing maintenance that natural turf will require means more work for all of these crew members. Yet every one of them has been for it and given a 110-percent effort to make it happen."

"I think the opportunity to convert Neyland Stadium to natural turf is a once in a lifetime experience," says Campbell. "And I wanted to make sure we did it right." Campbell issued a memo to all involved as field construction began that laid the groundwork for the entire project: "We are going to build the best field that can be built, given what we know today about agronomy and athletic field construction."

Campbell had formulated precise plans for the field construction. He knew the field layout, design and details; the irrigation and drainage systems that would be used; the turf type and specifications. Dixon was hired as a consultant representing the university — to select the proper materials, write the precise specifications, and handle the quality control to ensure that specs were met.

Normal university bidding procedures were followed. The general contractor awarded the bid had never built a football field before. Campbell served as the "unofficial" on-site supervisor and coordinator, as well as filling his role of providing guidelines and input on the overall project.

Though USGA-greens guidelines would be followed, there were some unique factors involved. First, there is no underlying "choker layer" on the field.

Finding the "right" sand was probably the toughest construction problem encountered. The University of Tennessee football program has a tradition of speed. Campbell and Dixon assured the coaching staff that the firm, fast track they desired would be retained in the new turf field. "We don't have golfers teeing off or putting and then moving on," says Campbell. "We have 300 pounders digging in and hitting each other, and 22 big guys running over the same basic area again and again. The underlying cause of every loose, torn up or poorly-performing sand-based field seemed to be an improper mix of sand or a poor or incompatible choice of sod. Those were two major problems we were determined to avoid. If there was to be any error in sizing the sand, it would have to be too fine for added stability, rather than too coarse."

More than 20 samples of sand were tested. Though many sands conformed to USGA guidelines, they weren't properly graded to contain the mix of fractions Dixon and Campbell were seeking. Finally, after six months of looking, they selected a fine-particle glass sand and blended it with the best of the USGA-spec sand. The mix still meets USGA guidelines, but "leans" to the fine side. The sand was then blended with Dakota Reed Sedge Peat for a 90-percent sand, 10-percent peat mix. Blending of the entire 12-inch sand-peat profile was done off-site to ensure consistency. Dixon tested and monitored each step.

An underlying 4-inch layer of pea gravel also took some searching to find. The gravel selected was found in Kentucky and barged downriver to the stadium.

The network of underlying drainage placed over the natural clay soil base uses 6-inch perforated drain lines on 15-foot centers running parallel to the field surface. A series of 4-inch drain lines runs in a herringbone pattern to both sidelines. Sideline piping runs to exit points into the river on the south side of the stadium. This below-surface field drainage is independent of the pipeline that carries drainage from the stadium itself and the surface water that drains from the field. The steep configuration of the stadium can produce heavy drainage during excessive rains. Campbell wanted the double piping system within the trenches to eliminate any potential problems.

The field itself is constructed with a 16-inch crown, similar to that of many native soil fields; another example of Campbell's attention to detail. "Though field percolation rates are hitting the 13 inches we planned on, the crown will help move surface water away from the playing area faster. And, if at some point we do decide to invest in a tarping system, it's far easier to remove a tarp from a crowned field than a flat one," says Campbell.

There is no in-ground irrigation system for the new field. "We wanted to eliminate 'things' in the field that held any potential for mechanical failure or for player injury. We've done that by eliminating pump-type sub-surface drainage and underground pipes, valves and heads."

The field is watered with six off-field Nelson 150 water cannons; three on each side of the field. They're hooked into a loop system of 6-inch water lines that can operate three cannons at a time at 80 pounds-per-square-inch pressure. Each cannon can deliver 270 gallons of water a minute. The main shut-off for the water system is under the stadium under lock and key to eliminate any accidents. Though someone does need to be present for each irrigation session, Campbell's assessment of the advantages outweighs any drawbacks. The system can deliver 1/2 inch of water in 30 to 35 minutes when necessary. Normally, only one or two of the cannons operate at any one time.

"Both Georgia and Auburn have water cannon systems," reveals Campbell. "Tom, Myron and I went to check them out. Tom was concerned with the droplet sizes that were issued, and Myron wanted to find out from the operators their assessment of the operational ease and efficiency. This feedback helped swing the decision."

Another challenge was finding the right turf in the best form. Campbell had already worked with Charles Williams, manager of Nutri-Turf division of Anheuser-Busch, Inc., Fayetteville, TN, on the University practice football field and golf range, and had great confidence in the company's abilities. Williams became nearly as absorbed in the project as Campbell.

When the decision was made to go with Tifway 419 bermudagrass, Dr. Lloyd Callahan ran DNA testing to ensure the specific plots were 100 percent true to type.

In order to avoid the soil interface and thatch layer that can become a problem even with washed sod fields, Williams opted to harvest the turf as sod, then hand-feed it through the shredding machines to produce sprigs that were virtually soil-free.

"Then he staged a parade of field planting," says Campbell. "A row planter was used to plant half of the sprigs into the ground at a depth of 3 inches, spaced in rows 4 inches apart. The row planter was followed by a broadcast spreader that spread the remaining half of the sprigs on the surface. A street roller followed behind to firm everything into place. Sprigs are normally set out at 800 to 1,000 bushels per acre. Williams used 4,000 bushels of sprigs on our two acres of field. The double-depth placement of soil-free sprigs was completed on May 9th. By July 4th, we had 100-percent coverage, with a strong rhizome base that stabilized the field."

"It took us awhile to reach a comfort zone in watering the newly-planted sprigs. The sand-based field has a much faster percolation rate than native soil fields, but water retention and availability to the plants was excellent. We filled the column with water and watered lightly again whenever the surface began to dry. Once the turf reached establishment, we increased the amount of water applied and lengthened the watering intervals to encourage deep rooting."

"Dr. Ward is doing tissue testing for us so that we can fine-tune our fertility program to match turf needs precisely."

"A moist sand-based field is similar to the section of beach bordering the water. It's firm enough to remain stable, yet gives enough to cushion activity that takes place on its surface. With the crowned field, and our infiltration rate of 13 inches, we're anticipating little need for tarping."

"We're now rethinking our field-painting process. We'll be painting the end-zone in an orange and white checkerboard pattern, as well as doing the traditional lining. We'll test out our system on the practice field to refine techniques and define timing options before we paint the main field. We'll also be closely monitoring the turf's reaction to the orange paint. We've researched paint options to find the least disruptive alternative."

"We've been able to do this project with few constraints. We didn't waste money - I'm much too conservative for that- but we didn't skimp on quality or omit things we felt were necessary because of cost."

"Public curiosity about this field conversion is extraordinary. Our coaches just competed in a golf tournament and the first question they were asked was 'What does the field look like?' We've set up a gate so that people can see the field, but not get out on it. We've been getting from 100 to 150 people a day since the field was in place, just stopping by to check it out. The official 'debut' is September 17th - on national TV - and we play the University of Florida.

"Sports turf managers have to love what they do - and our families have to love us to put up with all the hours we devote to field care. Grass doesn't read a calendar or a time clock. My personal support system is terrific - my wife Toni, a math teacher at the university; son Peter, a freshman at the university in electrical engineering - and a member of my grounds crew; and my daughter Tracy, who is just starting 9th grade – all look out for me."

"If I have any edge in sports turf care, it's that my years of coaching help me understand what other coaches are looking for in a field - and hopefully help me anticipate and keep a step ahead in filling their needs. But just when you think you understand most of the ins and outs of turf care, that grass becomes determined to fool you. It's an ongoing challenge - and one that's got me hooked." ❑

Editor's Note: Bob Tracinski is the manager of public relations for the John Deere Company in Raleigh, NC, and public relations chair for the Sports Turf Managers Association.

Construction Details

By Chuck Dixon

There are several unique features to the conversion of Neyland Stadium from an artificial surface to natural turf. First, Bob Campbell, Athletic Director Doug Dickey, Head Football Coach Phillip Fulmer, the university administration, and the entire staff were 100 percent behind this project. That in itself made the total project flow easier.

Using no intermediate sand layer cut construction costs. Tracking down an appropriate sand source to reach the proportion of fine fractions while keeping within the USGA guidelines presented a challenge. We used a blend of fine silica glass sand with the golf-grade sand to reach the proportions we wanted, and still remain within the parameters of the USGA specifications. Because my consultation agreement with the university put me in charge of the selection process and quality control, extra steps were eliminated, which saved time and money.

The field-sprigging process used was unique. It should eliminate many of the problems in later maintenance that fields encounter with the soil interface and thatch layers inherent with sodding, even when washed sod has been laid.

Also unique is that there are no irrigation heads on the field. Campbell opted for water cannons instead of in-ground irrigation.

We collected data in early August, and the actual total pore space, bulk density, water retention, and percolation rates fit the computer-generated data of our preconstruction field specifications. This basically means we accomplished what we set out to do.

We'll expect to see more surface organic matter as the field matures, especially since there will be an annual transition from bermudagrass to perennial ryegrass and back again to bermudagrass.

Campbell did his research and selected initial practices that most turf specialists would agree with. The field has a solid clay base, the rootzone is uniform, and the initial root structure looks very good. Sod usually isn't harvested until it's a year old. This field's turf was sprigged in May and it will be ready to go for that September game.

I anticipate that the field will have more of a structural mat with the sprigging process used, and that there will be less need to core aerify to reduce compaction without the initial soil interface.

The entire field concept was good, and I have high expectations for it to continue to be an excellent field. Bob and his staff have the commitment and track record to keep it in top shape.

Editor's Note: Chuck Dixon is president of technical operation for Turf Diagnostics and Design, Inc., Olathe, KS, and served as the University of Tennessee's consultant on this project