Mississippi State University:

The World's Big

Scott Stadium has served as an important site for the evaluation of the PAT System in southern climates. For more than 12 years it has stood the test of 30 games per season.

Don't look for it in "The Guiness Book of World Records." Even Ripley might not believe it if he were still around. But count on it anyway: Mississippi State University (MSU) has the world's biggest classroom.

That's because all 1,000 acres of the MSU campus are the real classroom—and the lab as well—for its Department of Landscape Architecture.

Teaching and research at most universities are confined to the classrooms, laboratories and libraries. Rarely do professors or instructors use the campus as a teaching tool or take part in the operation or maintenance of the campus.

This is unfortunate, because if they did, they might be able to accomplish some of the wonders the faculty at MSU has achieved.

Working in conjunction with the Athletic Department and the Department of Physical Plant, the faculty of the Department of Landscape Architecture is deeply involved in campus design, construction and maintenance. Instructors involve the students in campus landscaping as a method of teaching, but the vast majority of the work is performed by 35 technicians employed by the department. This unique arrangement, evolved over the past 12 years, has attracted students from across the nation and resulted in important advancements in sports turf and landscape technology.

The concept is being expanded to other departments within the university. This fall the university's Business School launched a new program for golf professionals. Only one other college in the country has such a curriculum. Nearly 100 students from 35 states have already enrolled.

The reason for the instant popularity of the program is credited to the way MSU put the program together. Not only did they first seek and receive the endorsement of the Professional Golf Association (PGA), they are rebuilding the school's 18-hole "pasture course" into a championship one for the students to study course operations.

The maintenance of the course, the stadium, practice fields and campus grounds, is the responsibility of Charles Scoggins, campus landscape coordinator and member of the Landscape Architecture Department. Since he joined the university in 1970, Scoggins is able to compare the results of operating as part of the Department of Landscape Architecture to operating as an arm of the Department of Physical Plant.

"I think it boils down to admitting what you are really interested in, engineering or landscaping," Scoggins explains. "The physical plant manager sees a stadium with seats, track, parking, concessions, scoreboard and field. We see a turf surface which must be carefully designed to withstand 30 games per season, heavy rains and hot, humid summers—surrounded by a stadium. By concentrating on the areas we are most interested in, the university gets the best results."

In fact, the arrangement between the landscape staff and the physical plant department started with sports turf at MSU. For years, MSU has fielded great baseball teams. In 1985, not only did the Bulldogs under coach Ron Polk lead the nation in attendance, they finished third in the College World Series.

The team in 1971 was equally talented, but the baseball stadium turf, like much of the campus landscape at that time, was showing signs of fatigue. "Baseball coaches like to practice on the same field they play their games," says Scoggins. "It takes special knowledge of the turf and infield to keep a field in collegiate condition when all practices and games are on the same field."

Scoggins had just joined MSU's physical plant staff as a maintenance foreman after completing his bachelor's degree in turfgrass management there. "Everyone on campus shared MSU President William Giles' concern over the condition of the university's turf and landscape," Scoggins reflects. "Giles was an agronomist by training and was exploring ways to solve the school's landscape problems. His first step was to establish an office of campus landscape within the physical plant department."

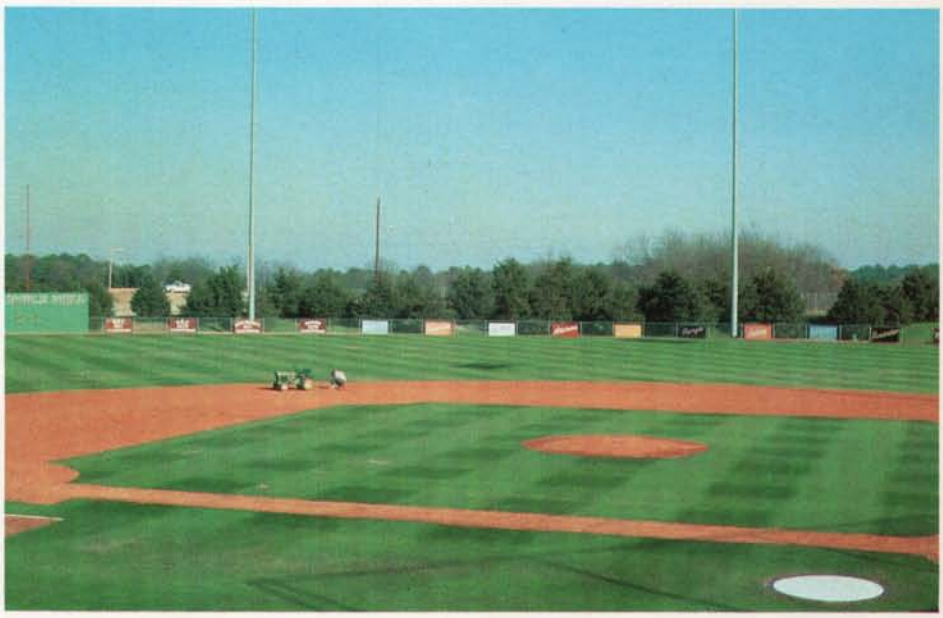
The first faculty member to volunteer his expertise to the campus landscape problem was Dr. Coleman Ward in the agronomy department, one of Scoggins' professors when he was a student. With the president's support, Ward set up a meeting with the athletic director Charles Shira, Scoggins and Bob Callaway, a person who would later lead the campus landscape department from the Physical Plant Department, to the Depart-

gest Classroom

ment of Horticulture and finally to the Department of Landscape Architecture.

The meeting went well. It was agreed that the campus landscape staff, with Ward's help, would rebuild the baseball field with the campus labor force. When the job was complete, Dudy Noble Baseball Field looked better than all the other fields in the conference and held up game after game after game. The department of campus landscape had impressed everyone.

But they had impressed Shira the most. Scott Stadium, MSU's football stadium, had been constructed in the '30s. Each year it was harder to restore a solid stand of turf before the next season. Even a short rain caused puddles to form on the field and turned the common bermuda into mud. The final blow was the last home game of the '73 season. The Bulldogs suffered a defeat on their home field with water nearly up to their ankles. Shira, Ward, Callaway and Scoggins watched the game and felt as humiliated as the players, soaking wet and covered with mud, walking back to the locker room after the game.



Dudy Noble Baseball Field was the first test of the campus landscape department and paved the way for renovation of other sports turf facilities at MSU.

There was little choice, the field had to be rebuilt. The most popular surface in the conference was artificial turf. As much as Shira respected his campus turf experts, his sports colleagues thought he should make a splash with artificial turf. It was up to Ward, Scoggins and Calloway to overcome this pressure and to recommend a field that would allow Shira to maintain his stature in the conference.

In retrospect, their recommendation not only made Shira and MSU leaders instead of followers, it turned out to be the greatest alternative to artificial turf in collegiate and professional sports today, the Prescription Athletic Turf (PAT) System.

At that time, no existing fields in the South were built to PAT specifications. Three PAT fields had been installed up North under the direction of agronomist/inventor Dr. William Daniel, of Purdue University in Lafayette, IN. Ward knew Daniel and understood his theories behind the PAT System.

Drainage and soil moisture are critical factors in management of natural sports turf. If the soil does not drain well, it compacts easily under traffic and will not serve as healthy medium for turfgrass roots. Compacted soils also rut easily and are very hard upon impact, both factors in sports injuries. If it drains too well, an excessive amount of water and fertilizer must be applied to meet the needs of the turf. But, a sports field must drain fast enough to remove an average rainfall occurring during or before a game.

Since the late '50s, Daniel had experimented with the use of sand in golf greens. To keep moisture levels under control in sand greens, golf course architects used layers of materials underneath the sand to create a "perched" condition. Daniel invented a system for greens that contained the water with a plastic barrier at the bottom of the sand layer. Daniel, after conferring with sod growers and sports turf managers about decent drainage for football and soccer fields, speculated that the same techniques used to make golf greens grow deep, healthy turf under heavy traffic, would also work for larger areas.

That meant taking specifications intended for the typical 5,000 square foot green and enlarging them to serve a 60,000 square foot field. If he succeeded, he could not only control moisture on the field, he could remove the 18-inch crown needed to drain conventional fields. Quarterbacks could see and hit their crossfield receivers better and fans and television crews could get a better view of the game. In other words, natural turf could do everything artificial could do.

"At the time, an artificial surface would have cost more than $400,000 and the PAT field was $120,000," says Scoggins. "But, an artificial surface was much easier to understand than some of the aspects of a PAT field." Ward carefully explained the PAT system to the athletic director and the university administration and answered their questions. Shira and President Giles decided to stick with their own turf experts and the PAT field was approved.

A contractor from Louisville actually did the work. The first step was to remove the crown and the next 15 inches of soil. Plastic film was laid across the entire field to make it into a "large bathtub." Dividing the field in two lengthwise, two networks of perforated drainage tubing were laid flat on the plastic and fed into two main drain lines. These drain lines led into a subsurface, co-

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vered concrete reservoir at one end of the field. From the reservoir, a main line was connected to a pump station off the field. Valves in the pumphouse enabled the pumps either to suck water out of the field and into a storm drain, or take water from a water main and pump it into the field. Since the field drain system was in half, pumping or suction could be applied to either side of the field.

"The MSU staff has contributed greatly to the PAT system, especially for its region of the country," says Daniel. "We've taken some of the information learned at MSU and applied it to the Orange Bowl in Miami. "They have helped ease some of the concerns about sand rootzones and proven that it maintains its benefits for years."

The first adjustment MSU made was the addition of a surface irrigation system. "We felt we needed surface irrigation to get granular fertilizers into the rootzone," says

The stadium and other athletic turf are the responsibility of (left to right) Charles Scoggins, coordinator of campus landscaping, James Thompson, athletic supervisor, and Tommy Buckelue, athletic crewleader (on mower).

The entire field was then filled with 16 inches of medium-size sand. Peat moss, perlite and vermiculite were tilled into the top six inches of sand and the field was sprigged with Tifway bermudagrass. No surface irrigation was installed since it was believed that subirrigation through the drain system would be adequate to meet all water needs.

The turf established well and was the talk of the conference during the '74 season. "MSU now had a field it could use in any weather," says Scoggins. When wet weather forced the team off the conventional practice field, they would move practice to the PAT field. The equivalent of 40 games per year are played on the field every season.

Daniel could not have asked for a better site for a southern PAT field. Both the departments of landscape architecture and agronomy were gifted with talent. The field has been a huge research plot and any weaknesses in its design have been observed and researched. The MSU staff has helped Daniel adapt the system over the past 12 years into the product it is today.

Scoggins. "We also use it to lightly moisten the sandy surface before a game or to syringe the turf in the summer to cool the field down." Surface irrigation came in handy when Scoggins noticed that sections of the field appeared to need more water than others. He was able to adjust the irrigation cyles to compensate for the problem. "We now know, thanks to MSU's help, that the original method of mixing the peat into the sand was uneven and caused some areas to hold more moisture than others," says Daniel. "But, it also told us that we added more organic material to the sand than we needed to."

In 1982, Scoggins noticed the infiltration rate of the field had dropped considerably. The original rate of 5½ inches per hour had dropped down to an inch. Suspecting the peat again, the decision was made to remove the top six inches of the field and replace it with new sand. What they found surprised them. The slits in the plastic drain lines were plugged with rust. The MSU staff studied the lines and discovered that the original sand contained a large amount of iron. Over the years, this iron leached down to the drain lines and collected on the slits. Both drainage and subirrigation had been effected.

The plugged drains were flushed or replaced. Six inches of new sand, tested for size and iron content, were spread on the field. A reduced amount of peat was carefully and uniformly mixed with the top four inches of sand. The field was sprigged with Tifway again.

"The infiltration rate was back to five inches and has stayed there for the past four years," Scoggins points out. "The dry areas have dissappeared and the system is working like the first day we turned it on."

The PAT field, completed most recently is at Findlay High School in Findlay, OH. This field reflects some of the refinements made in recent years. Instead of dividing the field into two halves lengthwise for the drainage/subirrigation system, Daniel has separated it into three sections lengthwise so the area between the hash marks can be managed separately. "Since the center section receives the most abuse," says Daniel, "we can now concentrate on its particular needs while lowering the maintenance on the outer sections."

The depth of the sand has also been decreased from 16 to 12 inches. "By cutting shallow trenches for the drainage network before laying the plastic, we have been able to eliminate a fourth of the sand," Daniel points out. "The cost of the sand usually represents half the entire materials budget for most fields. We determined we could save the customer money while preserving the effectiveness of the PAT system."

The amount of peat has been reduced and the method of mixing it with the surface sand has been changed to assure uniformity. Also, all new systems include surface and subsurface irrigation. This enables the field to be fertilized through the surface irrigation system and gives the manager more control over surface moisture content. Finally, moisture sensors are installed in the field and linked to the surface irrigation controller. The moisture data can also be used to adjust the subirrigation system.

"There is no doubt the incidence of Pythium is lower on PAT fields," Daniel states. "This is a valuable aspect for all fields with cool-season turfgrasses and southern fields when overseeded with ryegrass."

While only 16 PAT fields were installed between 1970 and 1985, three were installed this year and four more are being planned for 1987. The acceptance of the PAT system as the standard for sand-based athletic fields in the U.S. is largely due to the feedback from the managers of existing installations and the university-based principles used to design it.

"Maintenance of the field at Scott Stadium is not significantly different than main-

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Fifteen inches of sand were spread over the plastic moisture barrier and network of perforated drainage pipe.

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taining our other fields," says Scoggins. "Our campus landscape crew takes care of mowing and fertilizing. Once a year we verticut, aerify and topdress with sand. We've discovered that the water level in the reservoir is not as critical as we first thought. As long as it's within a range the root depth is excellent.

"It is clear that we need to use surface irrigation much less on Scott field than we need to for our conventional fields. We also use the pumps frequently to suction off excess moisture from rains falling during or before games. It takes a tornado to stop a game now."

Surprisingly, Scott field is not usually overseeded for the football season. This month, however, Scott Field will be one of the stars of a nationally televised game. "To make the field sparkle for television viewers, the Mississippi Federation of Cooperatives donated Palmer perennial ryegrass to overseed the field," says Scoggins.

But, the dressing up of the stadium doesn't end there. Campus landscape architect Sam Hogue has added a berm at the end of the field that will be planted with shrubs and

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annuals. The colorful berm will be balanced on the other end of the field by rows of southern magnolias. The Bulldog logo will be displayed on a cantilever roof which conceals the pumphouse. "These kinds of touches simply would not be considered by most physical plant directors," says Hogue.

"It's ironic that some of the schools encouraging MSU to install artificial turf in 1974, are now asking lots of questions about our PAT field," says Scoggins. "It's too bad Shira is not alive to see the switch."

The sports field responsibility of the campus landscape department was expanded even further in 1980 when it designed and installed a four-field practice area for football. The fields are conventional with 18-inch crowns. They are also aerified and maintained to a level as close to Scott Field as practical. The design work for the practice complex was also done by Hogue. "I don't hesitate to call specialists when faced with a design problem," says Hogue. "Usually, all I have to do is call someone on campus. In the case of the golf course, we contacted a golf course architect at the very beginning of planning."

Until recently Hogue both taught and did campus design. The volume of design work reached a point where he was forced to give up teaching. "We are working on improvements to Scott Stadium, a new baseball stadium, the golf course, and many projects on campus," says Hogue. "It's important that we continue the landscape themes we've established in the past ten years. Charlie Scoggins and I make a good team and MSU supports us all the way. It's important to continue the tradition so many MSU faculty worked to establish."

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Bob Callaway, another person that played a major role in campus landscaping during the past 15 years, recently left the university. As campus landscape coordinator and assistant professor of landscape contracting, Callaway was instrumental in moving the campus landscape department from the physical plant department to the Department of Landscape Architecture. He also gained support for and set up a landscape management curriculum at MSU. Graduates of his program never lacked a job when they graduated.

Callaway labored for three years to establish the new golf professional program. He contacted the PGA and negotiated with them to set up a program that fit their needs. Soon MSU will be able to supply golf professionals from its PGA program in addition to golf course superintendents it already trains in its turf management program.

"For 15 years Bob Callaway did not let anyone forget the importance of landscape design and maintenance on this campus," says Scoggins. "As his assistant, it was my job to take his ideas and apply them to campus maintenance." The result is a one-of-a-kind arrangement for campus landscape management, many awards, and a faculty involvement rarely found on other university campuses.