

discovery RESEARCH HITS THE ROAD

Turf study teams students and faculty with the NFL

By Erin Ryan

Fourteen days, 13 nights, 5,244 miles, a half dozen hotels, dozens of restaurants, hundreds of songs on the radio we never want to hear again, the Rocky Mountains, the swamps of the Bayou, the plains of Kansas, the big cities, the small towns, various parking escapades with a 30-foot trailer and van, the sweltering heat and humidity of the southeastern U.S. in August, and we made it! We're alive!

Blogging from the road last summer, Seth Kuhlman, Ben Cooper and Jackie Forhan summed up a scientific journey that put Boise State research on the map. They were alive and in possession of data that could change professional football where athletes' feet meet the field.

Backed by an NFL research contract worth \$115,641, mechanical engineer and Boise State graduate Kuhlman (BS, '05, MS, '07) designed and built a 1,200-pound instrument affectionately called the "Turf Buster." Hauling it from stadium to stadium, he and his team tested 13 NFL-sanctioned shoes under three movement conditions and simulated pressure on everything from synthetic FieldTurf at the Louisiana

Superdome to old fashioned Bermuda grass at Tennessee's LP Field.

"It was a whirlwind of fun, long days — very long days at times. Looking back, it did kind of fly by," says Cooper, a graduate student in the Department of Kinesiology pursuing a degree in exercise science and sports studies.

The team started at Invesco Field in Denver and went on to LP Field in Nashville, the Georgia Dome in Atlanta, the Superdome in New Orleans and Texas Stadium in Dallas. Testing lasted up to five hours a day, with Kuhlman operating the machine and Cooper adjusting experimental variables while data was processed by Forhan, a senior majoring in materials science and engineering.

Back in the biomechanics lab Kuhlman manages in Boise State's College of Engineering, they are looking for connections between playing surfaces, shoes and common injuries. Ankle and toe sprains and fractures are the biggest threats, and the Turf Buster team hopes to bring science closer to prevention.

Anchoring that team are faculty



members Ron Pfeiffer and Michelle Sabick. Pfeiffer is a kinesiology professor, and Sabick is an associate professor of mechanical and biomedical engineering. Together, they direct the Boise State Center for Orthopedic and Biomechanics Research and designed and led the turf study.

It wouldn't have happened without Michael Coughlin, an orthopedic surgeon in Boise who also is co-chairman of the NFL medical subcommittee and one of Boise State's clinical partners. He suggested Boise State had the resources and talent to pursue a study, and the NFL agreed to support it.

"This project certainly has the most celebrity factor," Pfeiffer says. "We've had larger awards, but as far as a private sector grant, this is the biggest we've been awarded so far."

After the results were analyzed, Sabick and Kuhlman presented a report to the NFL medical subcommittee. One interesting finding suggests that, in general, traction on artificial turf appears to be more dependent on shoe design than it does on natural surfaces. Therefore, the shoes an athlete wears

affect his potential for greater performance and for injury on artificial surfaces.

"More research needs to be conducted to identify shoe-surface combinations that truly maximize performance while minimizing injury risk," Sabick says. "My first feeling with any research project is that you try to answer one question and open up 10 or 20 more."

"It's a complex problem, so the work we're doing has just busted the door open. This project will yield results, but the biggest impact will come in the future," adds Cooper.

For now, the Turf Buster team is setting an example of interdisciplinary, intergenerational collaboration.

"We have different perspectives and methods. That makes our research more interesting and stronger at the same time," Sabick says, adding that even more than the group dynamic, hands-on experience is invaluable to cultivating the problem solvers of tomorrow. "The road trip allowed them to see the blood, sweat and tears it takes to do this kind of project."

"There was a lot of sweat," Cooper agrees, "but it has helped tremendously. You can learn in a book or a class all day long, but if you can't see it applied, it's hard to make those connections. It's about being able to see the big picture." ♦

Above: Researchers arrive at LP field in Nashville, home of the Tennessee Titans. Left: Ben Cooper, Seth Kuhlman and Jackie Forhan pose with the 1,200-pound Turf Buster.



CULTURE, CAREER COME FULL CIRCLE

By Sherry Squires

"THERE WILL ALWAYS BE A DITCH IN FRONT OF A PERSON IN A HURRY."

Mohan Limaye has taken this Indian proverb to heart. After teaching business courses for 25 years, the emeritus professor has returned to his first love, ancient Indian literature, and is finding that patience pays off.

Limaye's research paper on the "Mruchhakatika (The Little Clay Cart)" — a play written in India more than 1,600 years ago that he remembers well from his childhood — has been accepted for publication by Indian Literature, a journal of the National Academy of Letters of India.

Limaye was born and raised in India. His father loved literature and drama, and Limaye was exposed to it regularly while growing up. He earned undergraduate and master's degrees in English literature, Sanskrit drama and economics in India. Then while working on his doctoral degree in the United States, he began teaching a couple of courses in advanced writing for executives. His career as a professor of business took off.

He taught in business schools at Colorado State University and the University of Texas before teaching at Boise State for 10 years and

retiring in December 2002. During his time as a business professor, he had 26 articles published in refereed journals in the field of management communication. But none was more gratifying than his recent literary accomplishment.

As an emeritus faculty member, he teaches courses on India in the Honors College. One of Limaye's students, senior Kim Price, helped

research his paper,

"Mruchhakatika (The Little Clay Cart): The Construction of Gender and Emotion in Act V, 'The Storm.'"

During the course of his research, Limaye examined a conversation in the play between the heroine and

her male companion as they walk through a raging storm. His paper is complimentary of the play, noting that its lyrical poetry serves a dramatic purpose in displaying gender and emotion.

Limaye plans to continue bringing a diverse set of classes on Indian culture, literature and history to Boise State, as well as continue his personal quest in analysis of Indian literature.

"I parted company with the liberal arts for a while," he says. "It's like a homecoming for me teaching Indian literature to college students." ♦

