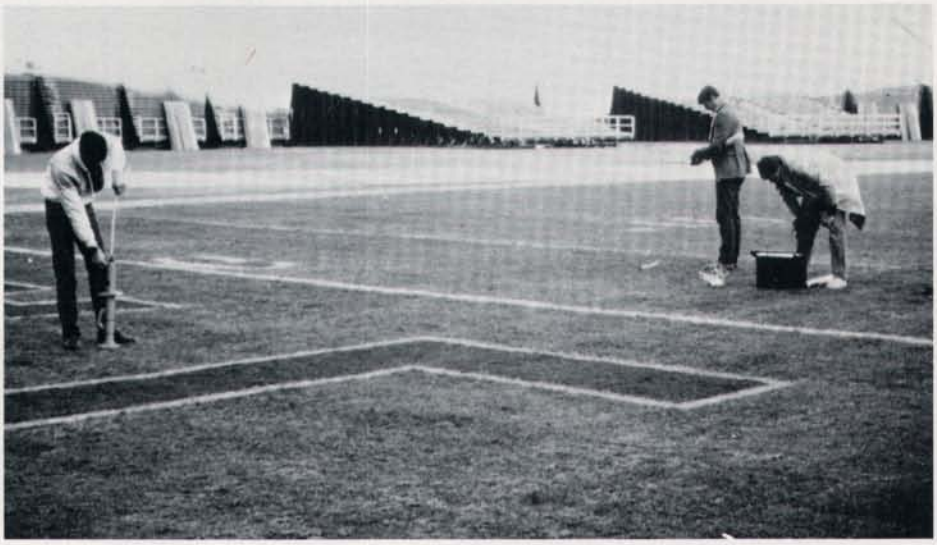
CHALKBOARD

TIPS FROM THE PROS

PENN STATE PROMOTES FIELD HARDNESS TEST

The Department of Agronomy at Pennsylvania State University in University Park, with a little help from Australia, has developed a reliable way to quantitatively measure athletic field hardness. Dr. Don Waddington and Trey Rogers, a graduate student working on his Ph.D., obtained a portable, computerized impact tester used "down under" for measuring the hardness of dirt roads. They initiated a series of tests to measure the affect of various types of surfaces and maintenance practices on field hardness.

After trying the device at the University's Joseph Valentine Turfgrass Research Center, Beaver Stadium and many of the practice and intramural fields on campus, Waddington and Rogers started taking the device to area high schools to gauge the hardness and safety of both natural and artificial playing surfaces. "We perform our tests on actual playing fields to simulate a hand, elbow or knee hitting the turf," says Waddington.



Penn State students demonstrate the impact tester at Atlanta-Fulton County Stadium.

The impact tester consists of a weight attached to an accelerometer, a device which measures how fast an object speeds up or slows down. "The faster the weight stops, the harder the surface is," explains Waddington. A hard, rigid surface not only stops a falling object quickly, it also absorbs very little energy upon impact. "If I held my hand out and you threw a baseball at it, that's going to sting," he states. "But, if I move my hand back as the ball hits, it won't seem as hard because I'm slowing down the stopping action." Sports turf should do the same.

The impact tester is connected to a vibration analyzer which displays the impact as a curve on an oscilloscope screen. The analyzer stores up to 50 impact readings at one time. "We can take readings from many locations on a field quickly and easily," Rogers points out. The results can be loaded into a computer for further analysis and storage.

Rogers and Waddington are looking specifically at the effects of mowing height, soil compactness, soil moisture and aerification on field hardness. Fields at two dozen high schools have been tested. "After you visit a number of schools, you start to see a pattern," says Rogers. "All of the practice fields are in poor condition. That's bad because that's where athletes spend 80 percent of their time and those fields probably get a quarter of the care that the game fields get."

The researchers are concerned that maintenance of many high school fields is neglected. At many schools there is no one whose primary responsibility is to maintain the grounds and playing fields. Often those duties fall to someone such as a building custodian who doesn't have the proper knowledge or training to care for a field.

Athletic field conditions have begun to improve as a result of the Penn State tests. Suggestions for maintenance and renovation programs developed by extension agronomist Jack Harper were sent to each school. Subsequent visits have shown that some of the schools are following the suggestions and improving their fields. "Results (from a survey of state high schools) showing that one in five injuries may be field related should be an incentive to construct and maintain high-quality playing surfaces," says Harper.

In addition to measuring field hardness, Waddington and Rogers measure shear resistance, or traction.

The Penn State research is unique because it focuses on how soil properties affect both the playing field surface and how the game is played. "In the past, the study of soil physical properties in turf areas has been primarily aimed toward providing a good environment for the turfgrass," Waddington states. "Now, there's a lot more interest in how the soil actually affects the play of the game." "We don't want just green cover anymore," says Dr. Al Turgeon, head of the Department of Agronomy, "our goal is to have a well-engineered field."

MESH STRENGTHENS SAND-BASED FIELDS

Tests at Texas A&M University at College Station have shown that small, rectangular pieces of plastic mesh mixed into a sand root zone before seeding or sprigging greatly improve the durability and wear-tolerance of natural surfaces. The work by J. B. Beard and S.I. Sifers confirms results obtained by the Sports Turf Research Institute in Bingley, England.

The two- by four-inch pieces of mesh made by Netlon Ltd. of Blackburn, England, are incorporated into the top six inches of sand or sand/soil mixture at a rate of 2.5 kilograms per cubic meter (roughly seven pounds per cubic yard). The pieces of mesh become interlocked in the sand to spread out weight placed on the surface of the soil. The roots of the turfgrass grow through the mesh and become anchored in it.

Beard and Sifers subjected Tifway bermudagrass growing in a USGA root zone mix containing the mesh to wear designed to simulate typical wear inflicted upon sports turf. Divots made in the turf grown in mesh were 35 to 45 percent smaller than those made by the same method in turf without mesh. A compression displacement test to simulate horse hooves or tires showed shallower penetration in the mesh soil than the soil without mesh. Tests to simulate lateral shear stress were inconclusive, but still suggested a certain amount of benefit.