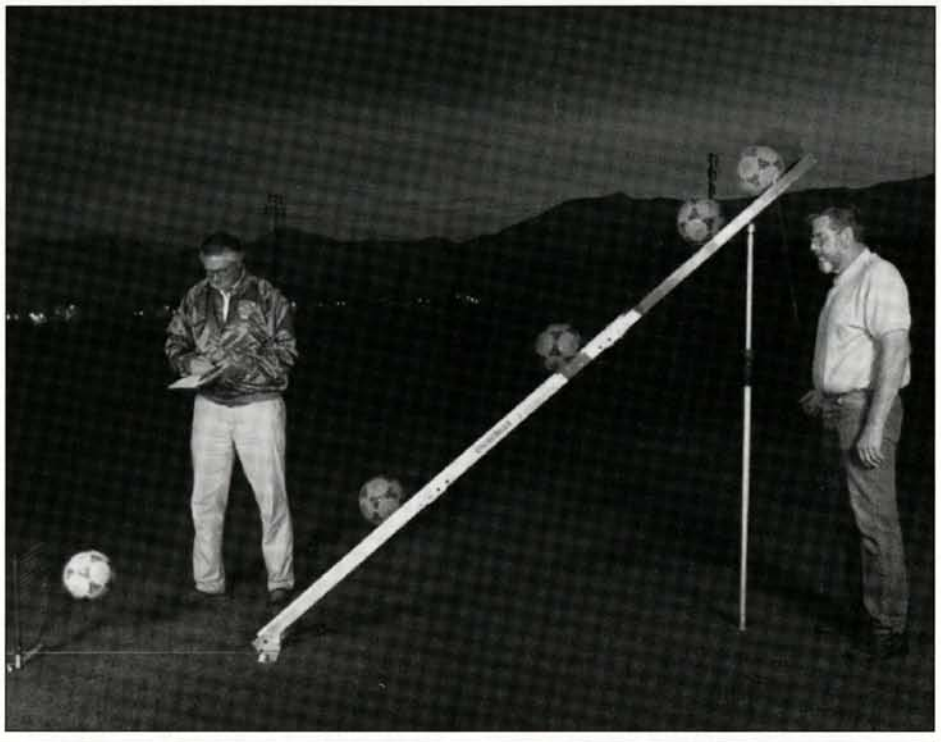
Field Playability:



Steve Cockerham (left) and John Kiesling demonstrate how the UCR Fieldgauge is used for testing. Photo courtesy: Mike Caprioti, UC-Riverside.

Measuring Performance

By Steve Cockerham

Bringing World Cup soccer to the U.S. was a challenge that many within the international soccer circuit didn't think could be pulled off. Early in the process, Dr. Jim Watson, coordinator of the World Cup Soccer's Architectural, Construction and Turf (ACT) team, asked me to help find some way to measure the performance of the field as it would reflect on the athletes' performance.

Because nine different venues, located in different regions of the U.S., were to be used, uniformity in field conditions was critical. The field performance was to be such that a world-class soccer player could be blindfolded and not be able to feel a difference between them. Because it would be the site of the finals, the Rose Bowl field was chosen as the standard, and all other fields would be measured and brought to that level.

Top players in every sport have the ability to gauge the impact of the playing surface on the game. Soccer players watch how the ball bounces, how it spins and how fast it rolls and gauge their actions to those conditions. These players (consciously or unconsciously) also gauge the combination of field resiliency, turf height and density to determine the speed of the field in comparison to their own athletic ability. These athletes can't tell you how they do this; they just do it. But they can tell you what their perceptions of field conditions are according to this instinctive perception. We wanted to quantify conditions in absolute, nonarguable, numbers. The University of California at Riverside (UCR) Fieldgauge was developed for this purpose.

John Kiesling, agricultural operations shop manager at UC-Riverside, and I have worked together in the development of turf "gadgets" many times over the past 12 years. For this project, I initially built a crude wooden model along the general lines of what I thought we needed. Kiesling put his skills to work on it.

After several models were built, tested and refined, we ended up with the UCR Fieldgauge. The finished product consists of a 10-foot-long aluminum ramp, the top of which is elevated to a height of 7 feet. A trigger at the top releases the ball consistently.

A second component is the ball hop indicator, a stand with a series of horizontal aluminum "arms" set into roller bearings positioned at two-centimeter intervals along the height of the stand. This stand was placed one meter from the end of the ramp.

For World Cup soccer field measurement we used two Adidas Questa official game balls. Each ball had internal air pressure of 8.5 psi each time. We soon found that, even with the same internal pressure, each ball had a slightly different roll. To further ensure accuracy, we used the same ball for each measurement repetition at a site. We placed the ball at the same point on the ramp with the valve of the ball at the same point each time.

Testing Procedure

As the ball rolled down and off the ramp, ball speed was measured by the

continued on page 22

Measuring Performance

continued from page 21

length of the roll in meters. As the ball moved off the end of the ramp and made contact with the field, it would bounce over the stand, just like jumping over a fence. The arms that were touched by the bouncing ball would swing out of the way. The uppermost arm that remained in position (the top arm that wasn't touched by the ball) became the measurement point for ball hop height.

During the testing and refining process of the UCR Fieldgauge, we compared what we could measure in ball performance with the perceptions of athletes on our local fields. As we could measure and quantify varying conditions, we'd ask these athletes to describe their "feel" of the field. We found that if we could measure it, they could describe it.

Next we quantified prime field conditions at the Rose Bowl with the UCR Fieldgauge. For example, the ball hop height at the Rose Bowl was 19 centimeters.

The next step was determining what degree of change and which cultural practices could be used to bring the fields at other venues to those standards. Research indicated that a 1/8-inch change in the height of cut was equal to approximately one meter in ball roll. Moisture level within the field growing medium had a direct effect on field resiliency and ball hop. Rolling a field can speed up ball roll dramatically. Verticutting can affect both ball speed and hop.

The week before the first game, Jim Watson, John Kiesling and I took the UCR Fieldgauge on a flying trip. We checked all nine venues in eight days. Kiesling had made further refinements in the unit for travel. All the components fit into one hard-sided golf bag and one attaché case. He also painted the UCR Fieldgauge red, white and blue because color-coding the components made it easier to put together. By the end of the trip Kiesling could put it together in five minutes.

Because all the World Cup games would be played within a seven-week period, we made some changes for the sake of uniformity that we probably would not have made in a normal, long-term maintenance regime. For example, we kept the mowing height of some of the bermudagrass fields higher than usual, which resulted in a bit of puffiness. We had some of the bluegrass and perennial ryegrass fields cut shorter than usual, which resulted in some loss of density.

Did the UCR Fieldgauge meet expectations? The overall impression — from the players, coaches, officials and World Soccer League — was that it did.

Will it play a role in future sports turf programs? Possibly. It may be used to set the standards during field renovation or new field construction. As soccer's popularity continues to grow, and leagues start to demand consistent, high-quality fields, it could be used to establish a national or international standard. It would then be used at the local level to check fields against that standard, especially for league play. ❑

Steve Cockerham is superintendent of agricultural operations for the University of California, Riverside. He's a past president of the national Sports Turf Managers Association and currently serves STMA as advisor to the board.