

Sprinkler calibration innovation means water, cost savings

By Lynn Tilton

For years superintendent Al Kline relied on factory-calibrated sprinkler heads at the University of New Mexico's two golf courses. After all, quality control at the factory assured him the sprinklers would perform as needed. But persistent watering problems caused him to take a second look.

He's still looking — and doing his own calibrating. That's because he has his own test area. The first thing he learned during 157 three-hour tests was that he was throwing plenty of water on the grass. "I was

overwatering 140 percent and still had Dunkin' Donuts on the fairways," he said during a calibration seminar at the test site just south of Albuquerque.

Troubled with brown spots, in spite of extra sprinkler work, Kline decided to contact California State University at Fresno's Center for Irrigation Technology about its work on sprinkler calibration. CIT has been testing sprinklers for 35 years and includes three technicians on its staff.

Kline soon decided to test every head.

The test is simple, far easier than the traditional way of placing 400 cans to take readings. It consists of putting 50 cans two feet apart in a straight line from the sprinkler head to the end of its throw.

It's a simple matter to collect and measure the water, and run the results through the computer program Kline bought from CIT.

CIT's Dr. Kenneth Solomon helped him get started, and the whole CIT staff has been "super cooperative," Kline said.

He said, "Dr. Solomon believes so strongly in head testing that he wrote me, 'There should be a law requiring sprinkler head testing prior to installation.'"

Kline agreed, adding that no brand should be exempt.

He also emphasized that Tim Cavellier, his sprinkler representative, "has given up weekends, holidays, and other time off to help me. When he couldn't be here, my wife, Jo Ann, has helped with the study."

TEST ACCURACY

The first challenge was test accuracy. Kline got this by stretching out an aluminum track, set dead level. Atop the track are concrete half-blocks, with cup holders glued in place. Plastic cups fit in the holders, and can be turned upside down and tightly fitted when not in use.

This keeps them from blowing in the wind between tests. Kline also installed, for \$4,500, a weather station, with the aerometer wired to pump controls. Thus, when the wind blows, the test shuts down automatically.

This leaves Kline and his crew free to take care of the regular work on the course.

Kline credits Jim McPhilomy, a retired golf course superintendent and irrigation consultant from Denver, for bringing the CIT test to his attention.

"We've found there is a difference even in the individual head," Kline said. "Planning an irrigation system is like planning a war. The goal is to fire for effect, and a sprinkler isn't effective if it's not accurate."

He's learned that even altitude plays a role in a sprinkler's accuracy. That may be why a head that performs well at the factory may not water as uniformly when installed, especially if there is significant el-

evation difference between factory location and the course.

Since Kline uses Toro, Buckner and Rain Bird heads, several factory representatives were on hand for the seminar.

Toro golf irrigation specialist David Marsh agreed with Kline's strategy.

"The goal is to schedule the irrigation cycle so you're not overwatering. Al's tests show how precise a given sprinkler head is for uniform application, he said.

Marsh noted that the traditional Christiansen's Coefficient of Utilization (CU) still is the industry benchmark, but manufacturers have tightened up the specifications.

"Ten years ago an 85-percent CU was our internal benchmark for good performance. Now the minimum for anybody is in the 90s," Marsh said.

BIG SAVINGS

The high cost of buying water and pumping it is a major factor. He said greater watch care in general can help reduce irrigation bills.

"Too often turf managers set up their watering cycle when it's dry, but fail to adjust for wet times," Marsh said. "A manager must check sprinkler use at least monthly to stay atop any overwatering problems."

The question of CU came up again and again during the seminar.

Kline said: "We don't think you guys can go with averages. Unlike a corn field, you have to keep the whole thing green."

No longer sold on CU, Kline said: "CIT would have us look at a scheduling coefficient which is expressed as a percentage of additional time to apply the water needed. I agree."

"We need to get off the average as looked at by CU, and determine how much more time we'll have to run that valve or that system to get all areas to a minimum wetness."

"This will help turf managers determine whether a particular head or system can remain as is, or whether it will pay to get into a major renovation."

That is what brought Kline into the picture. He knew the university was paying dearly for water, yet he still was troubled with brown spots on the course.

THROW INCONSISTENT

A typical problem is brought on by the head throwing less water next to itself, more water in the middle of the throw, and tapering off to the edge.

"We found that sprinkler application evenness can vary from one-eighth to a half-inch per application," Kline said.

For example, a sprinkler with a CU of 0.7 inches of water per hour at the head dropped to 0.62 just four feet away, only to peak 10 feet further along at 0.778.

From there it was downhill all the way. That same head registered 0.59 at 20 feet, 0.41 at 26 feet, 0.285 at 32 feet, 0.15 at 42 feet, 0.075 at 46 feet and 0.004 at 54 feet.

Extending the watering time to get adequate amounts for the deprived areas of the throw means overwatering other parts. Not only does this lead to higher energy bills, but to increased disease problems.

Kline said: "We need to know how accurately a particular head performs. This doesn't currently appear in manufacturers' catalogues. They tell us how much water a head uses and how far it will throw at given pressures, but there's not a thing on how well that individual head operates."

Kline reiterated: "By this test, we've discovered that all sprinklers are not created equal, even those from the same manufacturer."

But after 157 three-hour tests, Kline has been able to trim individual heads, resulting in more even watering patterns.

The limit of repair has been economic. While he's been able to adjust or change orifices, he hasn't had the budget to deal with pipe sizing, head spacing, or even outright head malfunctions.

He admitted: "I used 280 million gallons of water last year, and at least 80 to 100 million gallons were wasted. In this part of the country that's \$40,000 to \$50,000 in excess water expenses."

"We're working next on heads in triangulation. Too often we managers put down twice as much water as we need. We need to react before we drown in our own water bills."

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Heavy rains aid parts of drought-stricken Fla.

Parts of Florida have benefitted from a wetter-than-normal winter and spring, while others continue to suffer the effects of a drought heading into its fourth year in some areas.

"We've gotten abnormally large amounts of rain in some portions of the state, particularly the southeast, in what is normally our dry season," said John Foy, director of the U.S. Golf Association Green Section's Florida office.

One of the beneficiaries has been John's Island Club in Vero Beach, where the 5.6 inches of rainfall from

April 1-21 was more than double the average 2.6 inches for that period, according to West Course assistant superintendent Tony McKenna.

The 65 inches of rain for the 12 months from April 1, 1990 through March 31, 1991 was significantly higher than the 49.9-inch average for the preceding three years.

"We had watering restrictions for a short time last year, but they were lifted," McKenna said.

"We've shut down watering whenever we can. We got 1-3/4 inches Saturday (April 20). We

didn't have to water Saturday or Sunday and we'll just do the greens tonight (Monday)."

Foy mentioned another Vero Beach club where talk of installing a new, water-efficient irrigation system has died down for the first time in three winters because of the wet weather.

But other sections continue to suffer from the drought. Foy noted the Lakeland area between Orlando and Tampa where Phase III watering restrictions, "about the most serious you can get," have been imposed.