

As much as superintendents want control over the golf courses they maintain, turfgrass conditioning comes down to something out of their hands – weather. It contributes to lush, green turf and dead, brown turf. It also makes or breaks superintendents, forcing them to react constantly to the effects of weather.

Weather monitoring tools, then, are critical for superintendents. They impact the bottom line and product efficacy, prevent product wastefulness and help contribute to healthy turfgrass.

THE WEATHER REPORT

It's no secret northern Georgia has been in an extreme drought. This year, areas of the state are two inches below the norm, and in the past 16 months, 20 inches below the norm. Even though the private, 27-hole TPC Sugarloaf in Duluth has been in a level two drought since last summer and under a restricted water-use regulation, Mike Crawford, CGCS, has managed to keep the course healthy, growing and alive. The drought in the state has been so bad that, this past September, 61 counties skipped level three and went directly to level four, which bans all outdoor watering. But the golf industry has been targeted unfairly, Crawford says.

"Golf, which is a \$3.5-billion business in Georgia, has been mandated to save 97 percent of water when other businesses were asked to save only 10 percent," he says. "The GCSAA is working with the state to come up with a plan that works for all."

In Georgia, any water running into or off a property can be controlled by the state.

In Austin, Texas, Mark Semm, director of golf course maintenance at the private 18-hole Spanish Oaks, has been dealing with weather extremes the past few years. In 2004, during his first season at Spanish Oaks, the area experienced a high rain season of 50 inches. The next 18 months were under a drought stage close to water restrictions. And last year, rainfall totaled 60 inches.

"I'm in my third full season and have yet to see anything that's normal weatherwise," Semm says. "We've gone from extreme cool,

wet weather to heat and drought."

Kevin Shields, in his third year as golf course superintendent at Tuscany Reserve Golf Course in Naples, Fla., is no stranger to weather extremes either. Tuscany Reserve, which opened in 2005 and has a maintenance budget of \$1.9 million this year, experienced two wet years – 2003 and 2004 – during its grow-in, but the past few years have been dry. The course, which is covered with seashore paspalum, also has endured two tropical storms, and two hurricanes (in 2006), in which 50 percent of the plant material blew over and had to be replanted. There were wash outs and wind damage but no flooding.

The area has been in a phase three water restriction since November. It was in phase two a year ago in April and skipped phase one altogether.

In April, Shields kept an eye out for cold fronts to prevent frost damage on ornamentals. If frost is predicted, he doesn't run the irrigation system beforehand. Shields was looking for a stretch of good spring weather. This year, January was warmer than February, and compared to previous years, the Gulf temperature was almost the same as the soil temperature this spring. Typically, April and May are the driest times of the year, and June is the start of the rainy season, which falls in summer. This year the area is down 37 inches of rainfall, and Lake Okeechobee is four feet below normal.

"Right now, we're in a drought," he says. "It's a struggle to keep things looking good."

TOURNEY PREP

TPC Sugarloaf is the site of the AT&T Classic, the PGA Tour event it hosts in addition to the other 20 to 25 annual tournaments played there. Greg Norman designed the 13-year-old course.

Because of the magnitude of the AT&T Classic, weather monitoring is an essential aspect of tournament preparation. In addition to the typical weather monitoring tools Crawford has on the property, he has help from the PGA Tour's on-site meteorologist during the week of the tournament. The meteorologist has tools most don't, such as national weather radar and professional Web sites, to predict wind, temperature, severe weather and precipitation.

At Spanish Oaks in Austin, Texas, superintendent Mark Semm has been dealing with weather extremes, from high rain season to a drought stage.
Photo: Spanish Oaks



6:40 AM...

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“We use that information to help determine what we need to do,” says Crawford, who was the first employee hired at TPC Sugarloaf during its construction. “For example, if it’s dry and windy, we’ll water greens by hand. Or if it’s too windy, we might not roll greens because we don’t want the ball rolling off the green too easily. Every year, we use the meteorologist’s information. He can predict harsh weather with extreme accuracy, so we’re able to get people off the course before a situation becomes dangerous.”

Crawford, who has been at TPC Sugarloaf for 13 years and a superintendent for 16, says meteorologists almost can predict weather to the minute because of the radar they use. And because of the nature of the AT&T Classic, which has a \$5.5-million purse and millions of viewers

worldwide, weather prediction is critical.

MONITORING METHODS

In addition to the PGA Tour’s meteorologist, Crawford has his own weather monitoring routine. He uses a DTN/Meteorlogix weather radar to the best of his ability.

“It can pick up rainfall that doesn’t hit the ground, so it can be misleading,” he says.

The radar information comes through a satellite system or the Internet. The information is close to real-time but not quite, Crawford says. The radar can be insurance policy.

“If you use radar just one time to delay a fungicide application, then you’ve paid for it,” he says, adding that he wants to avoid applying a fungicide only to have it washed off the plant.

Like many superintendents, Crawford also uses a weather station, which is tied to the irrigation system, to help determine whether to irrigate or not. The weather station measures evapotranspiration, windfall and wind speed. Crawford also watches the Weather Channel.

“In my office, the Weather Channel is on TV all the time,” he says. “I watch it twice at night and listen to the radio for weather on the way to work.”

But unlike some superintendents, Crawford doesn’t have the ability to control his irrigation system remotely. That’s one of his goals this year.

Like Crawford, Semm has an on-site weather station in an area that’s a good representation of the entire golf course. The station tracks weather by the hour, day and month, and tracks temperature lows and highs, humidity, precipitation, solar radiation and wind. Semm compiles all the information and uses historical totals to determine when to start his semiannual verticutting and aerifying.

But Semm hasn’t been relying on weather data as much. Lately, extremes – dry and wet – have caused him to turn on a dime. He uses the Farmers’ Almanac, which he says has been pretty darn close in giving general trends of the year, as well as the National Oceanic and Atmospheric Administration’s Web site and the Weather Channel. He also watches local news stations daily.

Additionally, Semm uses the DTN/Meteorlogix forecasting tool, for which he pays an annual fee. He used to pick the information up through one of the company’s satellites, but he now uses the Web-based program. The tool has a parameter of 50 miles and can send warnings via cell phone, e-mail and text message. It tracks light rain, moderate rain and heavy rain, as well as lightning.

Semm’s weather station is integrated into the irrigation system so the system will shut down and won’t irrigate when it’s raining or will stop if it’s too windy. This can save between \$5,000 and \$15,000 a year, he says.

“For me, I sleep better at the end of the day when I put together something based on the information we have,” Semm says.



Weather station use at Spanish Oaks can save between \$5,000 and \$15,000 annually. Photo: Spanish Oaks



Even though Tuscany Reserve in Florida is experiencing drought conditions lately, the color of the seashore paspalum is hanging in there. Photo: Tuscany Reserve Golf Course

Shields' method is a bit different than Semm's. He uses a lot of history from previous years, tracking weather information on the Internet or by his hand-written notes from years past.

PROBING FURTHER

Aside from weather radar and stations, Crawford uses small soil probes to core greens throughout the day, looking for dryness to know when he needs to hand-water greens.

"Soil moisture consistency on greens is different," he says. "You never get it exact. Our typical irrigation cycle is seven minutes on all greens. Four or five greens get more air movement and sun, so they dry out quickly. We monitor them more closely to watch for wilt. We want to put out only the water needed to keep the plant healthy. Watering by hand is labor intensive, but the money we spend on that is worth its weight in gold."

Still, Crawford saves a lot on labor overall because of weather monitoring.

Shields would like to be using a soil probe, but he says it all comes down to money and budgets, and with the way the economy is, soil probes aren't an option right now.

CULTURAL PRACTICES

Semm, who has been at Spanish Oaks four years and a superintendent for seven, operates

the seven-year-old course with a \$1.9-million maintenance budget. The course is in hill country, built on rock and capped with a sandy loam profile eight to 12 inches deep. The USGA-spec greens feature TifEagle, and TifSport is everywhere else.

Ninety-five percent of Semm's cultural practices are conducted based on weather. There are a few things he would do agronomically in the rain, but topdressing is an exception. Always thinking about the weather, Semm tries to time wetting-agent applications during or within 48 hours of rainfall to get a wetting agent to wash in. Potassium and gypsum application for greens are timed with rain, too.

Shields's maintenance practices also are dictated by weather, and he also applies wetting agents right before it rains. He applies less fertilizer in the rough and in out-of-play areas because they're dormant.

On Jan. 15, a phase three water restriction took effect in some areas of Florida, allowing Shields to use only 180,000 gallons a night to water the golf course, common areas and surrounding home lawns. He submits a water report once a week detailing how much water he uses.

"I'm basically watering just the tees and greens," he says. "I haven't watered the rough in six months. The color of the paspalum is hanging in there, though." **GCI**



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CURATORS OF THE COURSE

TAVISTOCK COUNTRY CLUB RESTORES ITS 1921 GOLF COURSE TO MINT CONDITION
By PETER BLAIS

Sometimes inspiration can come from something as simple as a couple of old, black-and-white photos on a men's locker room wall. That was the case at Tavistock Country Club in Haddonfield, N.J., an Alexander Findlay original design that opened in 1921.

Upon close inspection of the course and the aging pictures adorning the locker room walls of the facility, architect Jim Nagle of Forse Design noted 14 of the original Findlay greens still existed. Unfortunately, all the original deep bunkers and lofty mounds, except one complex on the 10th hole, had changed drastically from their original forms.



The renovated fourth hole at Tavistock. Photo: Jerry Sheets



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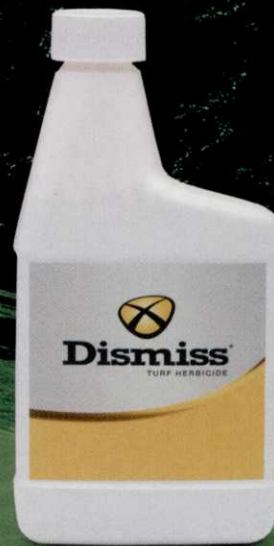
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AT A GLANCE Tavistock Country Club

Location: Haddonfield, N.J.

Web site: www.tavistockccc.org

Type of project: Restoration

Cost: \$5 million

Course closed: July 31, 2006

Course reopened: June 1, 2007

Architect: Jim Nagle of Forse Design

Builder: Frontier Golf

Superintendent: Tom Grimac

Soon, Nagle, golf course superintendent Tom Grimac and several Tavistock members were searching for additional photos and descriptions of the course's 1920s-era features.

"The members were already considering a restoration project," Nagle says. "When I saw the original bunker complex on No. 10, examined the internal slopes on some of the greens and compared them with the two black-and-white photos, I was ecstatic."

Part of the excitement came from studying other Findlay courses in the area that featured mound and bunker complexes with deep bunkers, some 15 feet deep. Lebanon Golf Club in Pennsylvania was a good example of the type of deep bunkers Findlay preferred, and Reading Country Club in Pennsylvania featured Findlay's work.

"Findlay's influence was out there, and we had a chance to bring it back to Tavistock," Nagle says.

A DESIGN LEGACY

Findlay, who lived from 1865 to 1942, was a golf pioneer who played a series of exhibitions against English golfer Harry Vardon and designed more than 100 golf courses, including such classics as The Breakers Golf Club (Ocean Course) in Palm Beach, Fla., and Aronimink Golf Club in Philadelphia.

What's happened at Tavistock throughout the years is similar to the types of changes that occurred at many Golden Era layouts. After Findlay's originally-designed course opened for play during the first year of U.S. President Warren Harding's administration, several other architects took turns lending their touch to the private club, located just seven miles from Pine Valley. A.W. Tillinghast, Robert Trent Jones Sr., William and Dave Gordon, and Brian Ault were among the designers drawn to Tavistock. Perhaps Jones had the greatest effect, adding several holes and rerouting parts of the course after an interstate highway cut through the property and eliminated significant acreage back in 1960.

ARCHEOLOGICAL ARCHITECTURE

Once Nagle, Grimac and a few members knew the potential gem they could unearth with a little extra work, it was time to sell the rest of the members on the idea. Nagle scanned photos of Tavistock's existing features into his computer, blew them up and presented them next to similar features at other Findlay courses.

"Once we showed the members the details of Findlay's features, they asked incredulously, 'Wow, that's what our course could look like?' It led to a fairly easy sell for the feature restorations," Nagle says.

One of the other selling points was that the Findlay restoration would add little expense compared to the cost of a generic renovation. Most of the greens, Findlay's primary emphasis, were intact, and the bunkers simply needed to be dug slightly deeper than they might have been with most simple renovation projects.

"It was helpful having a company with which we were familiar – Frontier Golf and its shaper, Jimmy Myers, had worked with us on other intricate course-restoration projects," Nagle says. "Having Jimmy on site was essential."

Another key to the restoration was that the club had completed a considerable course upgrade recently. Tavistock installed a new, \$2-million irrigation system, including pumps, a filtration and fertigation system, and a significant amount of drainage work.

"We're also in the middle of a massive tree-management program," Grimac says. "We've opened up the course by taking out 3,000 trees in the past five years. We're still not even close to what the land was like back in 1921. Like Oakmont Country Club or Philadelphia Country Club, our original photos show there was just a handful of trees here when the course was originally built."

UNDER CONSTRUCTION

Grimac closed the course July 31, 2006. The construction team would beat the reopening date, June 1, 2007, by nine days.

Using knowledge gained from studying Tavistock's own photos, plus the examples mimicked

Most of the greens at Tavistock were intact, and the bunkers simply needed to be dug slightly deeper than most simple renovation projects. Photo: Jerry Sheets



from other Findlay designs, Frontier began reinstating the ground features Nagle felt had been lost throughout the years, particularly around greens and bunkers.

“Myers and Nagle did a masterful job on those ground features,” Grimac says. “They rebuilt all the bunkers and mounds, and many of the tees.”

Nagle was on site frequently to oversee the shaping and make sure the work looked the way he wanted it. He also put together a portfolio of photos for the builder to refer to on site.

“It was a historic restoration, but it was still important to modernize features to fit with today’s game of golf,” says Chris Brennan, Frontier’s project superintendent. “While many of the fairway bunkers were similar in design to Findlay originals, they were placed in different locations than they would have been in the 1920s to accommodate the longer distances

today’s golfer hits the ball.”

Nagle, Grimac and Tavistock committee members did a fantastic job in the planning stage, Brennan says. That effort minimized the number of challenges faced by Frontier and allowed the construction firm to meet its deadlines.

“The main time constraint involved seeding two new greens and several green expansions that occurred in the first few weeks,” Brennan says. “But it worked out fine.”

“The project was well planned,” he adds. “We had weekly staff and committee member meetings. They were monotonous at times, but it was definitely the best way to run the project. Everyone was on the same page – club officials, the superintendent, contractor and architect. Everyone knew what the others were doing.”

The meticulous planning process also resulted in the project having few change orders. Any

changes were generally one of two types – an increase in sodded areas or additional drainage. Additional drainage helped because much of the property is in a floodplain, Brennan says.

Nagle believes the major challenge he and Frontier faced was rebuilding the 16th green. The putting surface on the 185-yard, par-3 is carved out of a hillside, about 18 feet above the tee. The back and front of the green had severe slopes. In the middle lurked a buried elephant. But because of the severe back-to-front slope, the huge central hump created interesting pin placements across the middle.

“The members loved that hump but hated the rest of the green,” Nagle says. “They felt if the green wasn’t rebuilt successfully the rest of the project would be a failure.”

Working with Nagle, Frontier took 3,200 GPS readings around the 16th green. Then they lowered and expanded the back of the green