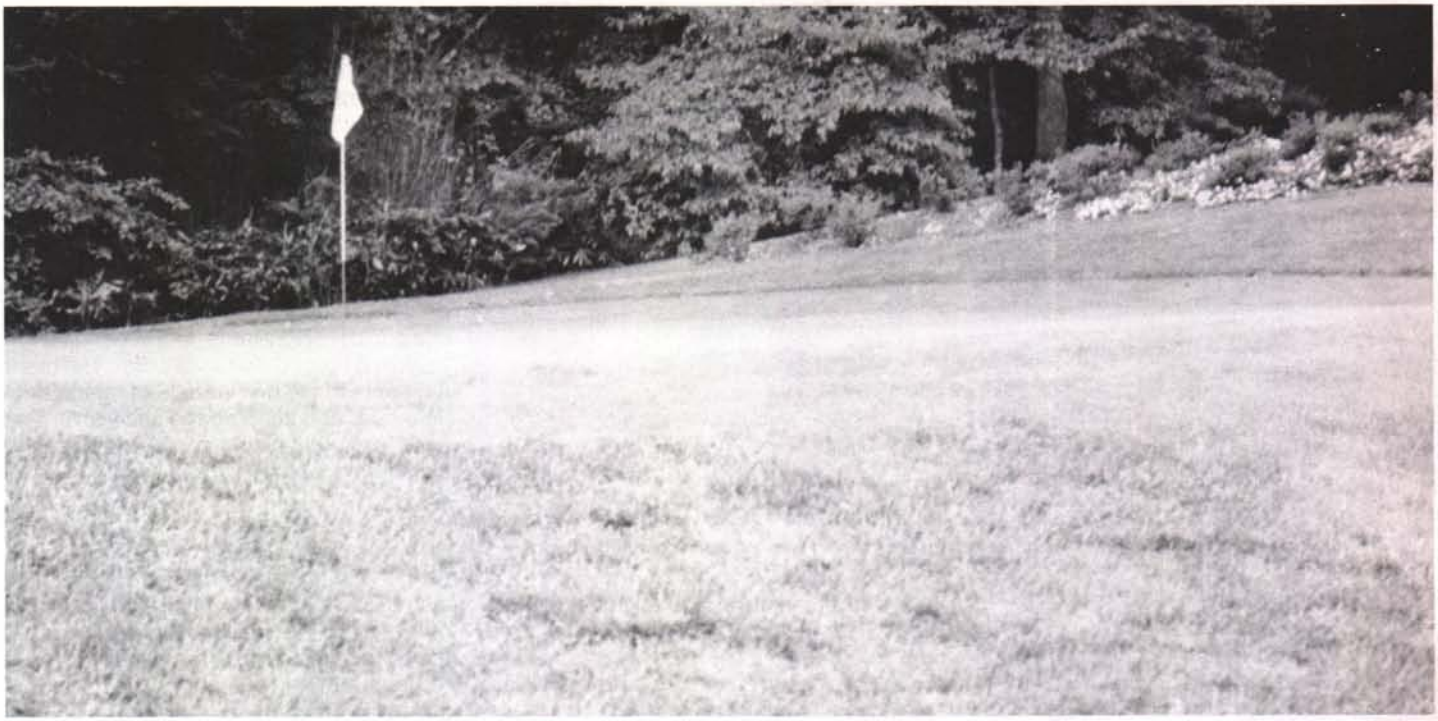

The approach to this green at the Biltmore Forest Country Club would get torn up easily before Don Burns installed a mat below the surface.

Fiber Technology: Protecting the Old With the New

Despite all the attention paid today to the newer "Tour" courses, the historic golf courses that were constructed prior to the Great Depression remain the foundation of the industry. Golf course architects and superintendents still speak with reverence of early architects such as Alister Mackenzie, Charles Blair MacDonald, Walter Travis, Charles Hugh Alison, Willie Dunn and Donald Ross. Their designs are held in as great esteem today as they were more than 50 years ago.

Many of these courses have been partially reconstructed to help them withstand the ever-growing traffic brought about by the post-War boom in golf that continues today. When these courses were carved out of virgin forests and native soils, little consideration was given to compaction, drainage or irrigation. As the golf industry progresses, the golf course superintendents of these courses must try to preserve the historic nature of their courses while protecting them from today's levels of play.

Don Burns, superintendent of the Biltmore Forest Country Club near Asheville, NC, faces this challenge continuously. Donald Ross designed the course which opened in 1922 to the standards of his day. Since 1975, it has been Burns' responsibility to keep the course up to today's standards. "Golf is a difficult game for anyone to master and our members don't want to be frustrated further by worn-out fairways and soggy areas resulting from poor drainage. They've seen how well-drained greens are playable shortly after it stops raining. They wonder why other areas of the course would stay soggy for days, especially low spots near cart paths and bridges. With the amount of play the course gets, it was hard to keep turf alive in these critical locations."

Burns saw the problem as more than poor drainage. Compaction caused by cart and golfer traffic was also to blame. He wanted to correct both problems at the same to keep disruption of play to a minimum.

He had recently used a product to reduce dampness in the pro shop which is in the basement of the clubhouse. Water in the soil against the foundation walls seeped into the concrete block. One of the members of the club, Palmer Skoglund Jr., urged Burns to use one of his company's products called Enkadrain. Skoglund is director of BASF's Geomatrix Systems. "I was skeptical at first," Burns recalls. "After all, it wasn't a water barrier. Water flowed right through the plastic mat covered on one side with a filter fabric. How was this going to stop water?"

He found out how when the material was placed against the foundation of the clubhouse with the fabric side out and then backfilled with soil. The Enkadrain created a void between the fabric and the foundation. Water simply trickled down the matting to the drain lines alongside the footers. Water ran off the wall instead of being sucked into it like a sponge.

Skoglund explained to Burns how the mat without the filter fabric could be used on banks to control erosion. By enclosing the mat completely in fabric it acts like a perforated drainage pipe. The mat looks like a blanket of heavy filaments, thicker than fishing line but thinner than the line on a weedeater, fused together so that 90 percent of the space it takes up is open to air, water or soil. When buried in the soil, the mat acts like an anchor for plant roots. The plants stay put and their roots extend out to stabilize the soil. The mat also absorbs some of the weight of people or vehicles crossing turf grown on top of it.

Burns first tried the mat on hole number eight. "Most players approach this hole from the path on the right side of the green," explains Burns. "In the summer, that area used to turn to solid dirt and when it rained the players would slide and tear up the whole area. Normally, we would strip the sod off, loosen the soil, level it, aerify it and resod it every year. Since no golfer likes to play around ground under repair, I wanted to put an end to this problem. After we stripped the sod for the last time, we buried the mat about two inches below the surface, filled it in with soil, leveled it, and resodded. This

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Enkadrain H was installed on top of drain tile in trenches across the seventeenth fairway.

Sports Turf Nutrition
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time the sod rooted into the mat. When it rained, players spikes did not rip up the turf."

Burns also had a problem on walkways to the greens on the number three and number 14 holes. "There's just one way to reach these greens and all the traffic is concentrated in the narrow walkways," he says. "Anything other than grass would interfere with the look and play of the hole. I wanted to give turf one last try before giving up."

Again, Enkamat was installed below the sod. "Grass has held up on the walkways now for four years," Burns remarks. "It doesn't pack down, instead it bounces back and doesn't wear out like in the past."

Once the material had solved two of Burns biggest problems, he started to experiment with other areas. He had a continuous problem with the steep banks of a pond on the number three hole. Golfers were constantly hitting into the attractive water hazard. In the process of retrieving their balls, they would tear up the turf on the banks.

"You can't resod an area like that since it is going to get torn up no matter what you do," remarks Burns. "All you can do is keep seeding it and hope the seed germinates fast enough to keep up with the damage from players or heavy spring rains."

This time instead of burying the mat, he placed it on the surface of the bank and seeded into it. The tall fescue, which usually took two weeks to germinate, started popping up after a week. While inspecting the site one evening, Burns put his hand on the bank and noticed it was still warm. The black filaments in the mat were holding the daytime heat and keeping the soil warm. The seed was germinating quickly because the soil stayed warmer longer on cool spring days.

Burns was also surprised that none of the members complained about getting tangled up in the mat while retrieving their ball. He also discovered that golfers trying to play off the bank did not tear up the slope as they had before. The grass has grown right through the mat. "Of course, we trim this area with weedeaters, not mowers."

Burns moved from the pond bank to slopes around the practice tee and along a creek running through the course. In both cases rains would wash out rivulets that had to be filled in regularly. This time the mat was buried below the surface and the area was reseeded.

After irrigation and rain had failed to erode the banks, Burns decided to try one more experiment. These large slopes had always been cut with walk-behind trim mowers because they were too bumpy for a riding mower. Today the mowing crew can go right up to the edge of the creek and all the way up the slope of the practice tee without stopping.

The once-skeptical Burns now felt he might have the answer to his soggy, compacted areas if the mat could be enclosed in filter fabric. He approached Skoglund about the idea and together they selected the seventeenth fairway as a test site. The fairway contains a low, flat area near the creek that is partly shaded by 50-foot-tall hardwoods. The area remained wet even during long, dry spells.

"Because the soil is heavy clay and the old tile was installed on a very slight grade, the drains were always getting clogged," he explains. "The trees block out the sun most of the day, so without drainage the fairway stayed waterlogged. We needed a way to keep clay out of the drain lines."

The traditional solution would have been to dig six inch trenches and install four-inch perforated pipe in gravel-filled trenches. All the soil from the trenches would have to be hauled off site. Perforated drain pipe wrapped in filter fabric was available and Burns intended to use it. But he also wanted some way to keep the gravel above the drains from clogging with clay.

Those early architects would shudder today to see the number of rounds played on their courses. But they would also be amazed at the high quality of the courses.

He started out the conventional way by digging a series of trenches, six inches wide and 18 inches deep, across the fairway to the creek. He placed gravel in the bottom of these and then inserted the wrapped drain pipe. Instead of filling the trenches up with gravel, he first inserted long strips of Enkdrain H, the mat wrapped in filter fabric, on top of the other drain pipe extending upwards to within two inches of the surface. Finally, soil was placed around both the drain pipe and the Enkadrain H to the surface.

"We could have installed just the pipe or the Enkadrain," said Burns, "but I wanted to make sure that the fairway water problem was fixed and we wouldn't have to inconvenience the golfers again for a long time. I'm happy to report that since spending a few extra dollars on Enkadrain three years ago we have not had a single complaint about the seventeenth fairway.

"Most superintendents face similar difficulties with drainage in heavy soils," Burns continues. "I see more and more superintendents getting involved with geotextile products, They are lightweight, easy to handle and can be put down quickly with minimal disruption of play. That's important to our club members."

They are also important in preserving the condition and reputation of golf courses that were built before these products were available to help superintendents protect them under today's higher standards and greatly increased play. When Donald Ross designed the Biltmore Forest course in 1922, he was setting new standards for the game of golf. But he was working with limitations set by nature. Not until recently has technology been able to correct some of these limitations.

This new technology is enabling the historic courses, which are the foundation of the golf industry, to withstand the pressures brought about by the popularity of the sport. Those early architects would shudder today to see the amount of rounds played on their courses. But, they would also be amazed at the consistently high quality of courses throughout the year.