Does This Stuff Work or Not?

An experimental green in Waco, Texas, may help answer the question.

BY JIM MOORE

It is a fair question, and one that should be asked more often. Today's turfgrass managers are faced with an extraordinary diversity of products to utilize in their efforts to produce the best possible playing conditions for their employers. The best managers base their selection of these products on a variety of factors, including effectiveness, cost, and continued support from the manufacturer.

Product information is certainly not hard to find. Sources include trade shows, industry journals, superintendent meetings, consultants, and, of course, the Internet. But in one respect, the Internet has complicated the search for reliable information. New products can be introduced to the industry for the price of a Web site. In the process, almost any claim can be made regarding product efficacy.

The USGA Green Section deals with this issue on a daily basis. The Green Section agronomists are frequently asked whether or not products work, and they base their assessments on many factors, including what they see actually in use on the courses they visit. But how about new products that have yet to be introduced to the mass market — how is information gathered regarding installation and application?

An experimental green was constructed at Ridgewood Country Club in Waco, Texas, to facilitate the on-site testing of new products. This green provides the opportunity to evaluate the efficacy of new products and to experience firsthand the installation or application issues that are associated with the products. The green is 8,000 square feet and does double duty as a short-game practice facility for the Ridgewood membership.

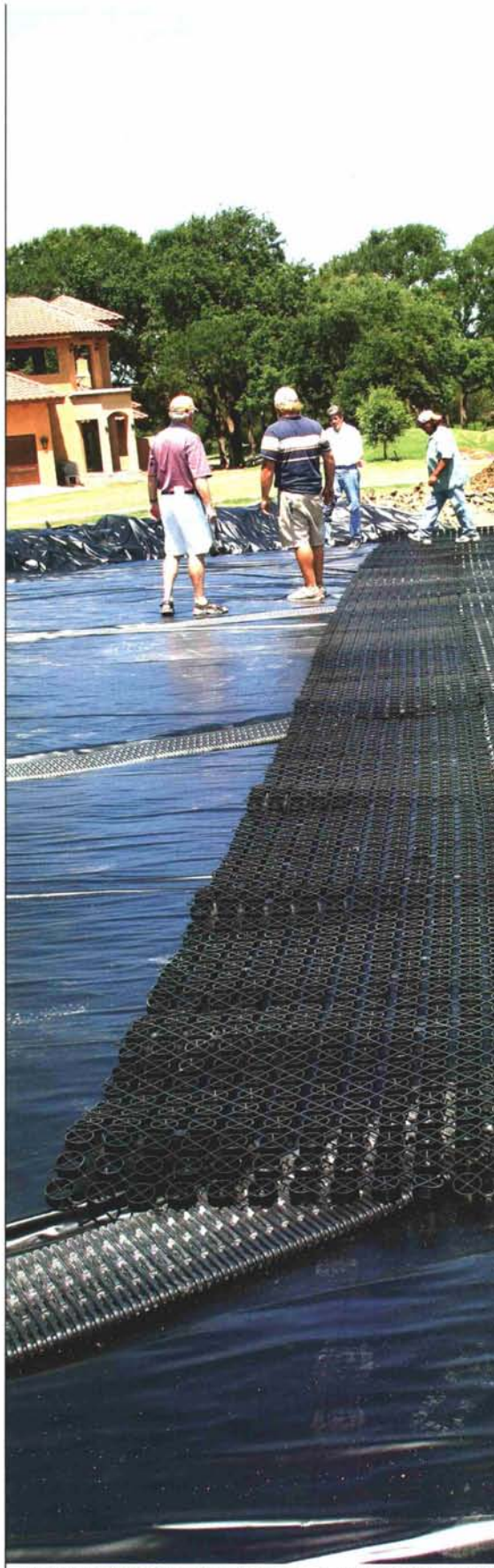
The following describe the products currently under evaluation.

IN-LINE FILTRATION TESTING

The experimental green was constructed of straight sand and lined with an impermeable membrane to simulate a "worst-case" scenario in terms of the leaching of fertilizers and pesticides from a putting green. There are two 4,000-square-foot halves to the green, with each half having its own independent drainage system. The exit drains from each half are plumbed to in-line filtering devices contained in an underground structure near the experimental green. Flow-monitoring devices and autosampling units are installed in the structure. Whenever 500 gallons flows through a drain line, a 900 ml sample is collected upstream and downstream of the in-line filtering unit. These samples are shipped to Dr. Kevin King of the USDA Agricultural Research Service in Columbus, Ohio, where they are analyzed to determine how effective the filters are in removing fertilizers and pesticides applied to the experimental green. The ultimate goal of this project is to work with the filter manufacturer to determine the most effective media for the filters to enhance their effectiveness.

ALTERNATIVE DRAINAGE MATERIALS

Greens built to the USGA method include a gravel layer that is a minimum of 4 inches in thickness and is installed



Each half of the experimental green is drained with materi
drainage blanket normally used in USGA greens.

s that have the potential to substitute for the gravel

beneath the 12-inch rootzone. The gravel layer is an integral part of the drainage system of USGA greens. In some parts of the country, properly sized gravel is hard to find and can be expensive. Gravel is very heavy and is expensive to haul, particularly given the rising cost of fuel.

Two products are being evaluated with the potential for being used in lieu of the gravel layer. These materials are lightweight and easy to install. Each half of the experimental green is drained by one of the products. Both products are similar in their function in that they use a porous membrane sandwiched by filter material to prevent the rootzone sand from plugging the membrane. Water flows through the membranes to the drainage pipe and eventually to the in-line filters described above. Moisture sensors have been installed to measure the ability of the products to adequately carry excess water from the green cavities.

WIRELESS ROOTZONE SENSING

The ability to monitor soil moisture, salinity, and temperature has long been limited to turfgrass scientists using expensive equipment in very specialized research environments. Recently, the cost of such sensors has dropped, making them more reasonable to install on the golf course. This reduced cost, combined with significant advances in wireless communication devices, makes the installation of rootzone monitors in greens much more practical than ever before. The experimental green has been equipped with four wireless rootzone monitors. Each monitor, or node, has two probes. The probes were installed at 4 inches and 10 inches beneath the green surface. Each probe has three sensors: moisture, electrical conductivity (for salinity measurement), and temperature.

The nodes were buried in four areas of the experimental green, with a fifth node installed on the number-three green at Ridgewood. Each node transmits the information collected by the sensors to a communications module mounted on a tree adjacent to the experimental green. This module sends the information to a receiver and a computer in the superintendent's office. Software allows the information to be viewed in a variety of ways. Particularly useful is the ability to monitor the

A subsurface drip irrigation system was installed in the grass face of the bunker adjacent to the experimental green. This allows the turf on the face to be irrigated without overwatering the adjacent areas.

An integral part of the wireless rootzone monitoring system is the node, probe, and sensor unit. Four of these units are installed in the experimental green to monitor soil moisture, soil temperature, and electrical conductivity (salts). The probes are installed 4 inches and 10 inches below the surface.

changes in moisture and electrical conductivity over hours, days, and weeks. It is even possible to connect the computer via the Internet to read the sensor values from a remote location.

Wireless rootzone monitoring is a promising new technology that should give the superintendent another tool for managing turfgrass areas and improving turfgrass health.

SUBSURFACE DRIP IRRIGATION ON BUNKER FACES

Grass bunker faces are difficult areas to irrigate properly. In addition to the steep slopes used on many bunkers, golfers blast large amounts of sand onto the faces, resulting in droughty growing conditions. During the hot summer months, applying enough water for these areas through the overhead sprinkler system can result in over-watering of the adjacent green or other areas around the green. One possible solution is the use of subsurface drip irrigation (SDI) installed in the bunker face. An SDI system was installed in the bunker adjacent to the experimental green at Ridgewood. The overhead sprinklers used for the green were adjusted to avoid applying water to the bunker area. The system has been in use for almost a year with very good results. SDI appears to be a viable solution to this irrigation challenge. Additional work with SDI is underway at two other courses in Waco and will hopefully yield equally promising results.

ALTERNATIVE PLANTING METHODS

The experimental green was established using four different bentgrass varieties. A unique planting method was utilized on two-thirds of the green. The seed was literally rolled onto the rootzone mix like carpet, using a lightweight paper-based product that is impregnated with seed and fertilizer. It comes in various widths and lengths as well as different seed and fertilizer combinations. After the product is rolled onto the area to be seeded, it is watered in by hand or with overhead sprinklers. This "melts" the product into the surface of the rootzone mix, resulting in very good seed-to-soil contact. Although wind is certainly an issue when using this product, the ease of application and the uniform seed distribution make it worth considering.

CONCLUSION

The experimental green has been heavily utilized over the past year with good success. In addition to the continuing study of the products already installed, more products will be evaluated in the future. This green provides an excellent opportunity to get a hands-on look at these products as they are introduced to the golf industry. In addition, the membership of Ridgewood Country Club now has an excellent short-game practice area.

This project would not be possible without a great deal of cooperation from many sources. The following companies have contributed their products and expertise to this project.

The Toro Company
Advanced Drainage Systems
Hancor Incorporated
Fabco Industries Incorporated
KriStar Enterprises Incorporated
The Freudenberg Company
Caylor Sports Sands
Colorado Lining
Airfield Systems
Advanced R2 Wireless
Thomas Turf Services
Turf Diagnostic and Design
Ridgewood C.C.
Cottonwood Creek G.C.

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