Want a uniform putting surface, ease of maintenance, economy, and water control?

Try Purr-Wick system greens

by William H. Daniel

"Purr-Wick" is a recently developed method of building or rebuilding greens and tees which allows for maximum use of the areas as well as providing economy and efficiency in future golf operations.

Good uniform playing conditions are what every golfer wants, but:

- Too often in the early part of the day the greens may be wet and soft, but before the day is over those greens may be too dry and hard. To provide the golfer with that consistently uniform putting surface is the turf manager's goal.
- Wet greens following rain cause aggravation. The rain is over, the sun is out, and the golfer is anxious to play, yet the course may be closed because of the wet greens. Most players don't appreciate the need for temporary greens nor closed courses. The golfer's time is limited, and he wants to play golf when scheduled.
- In much of the country, opening of the golf course in early spring can be a problem for both the players and the superintendent. The winter's process of freezing and thawing produces a spongy soil on the putting surface. As the surface thaws above a frozen base a critical situation occurs. Walking on the wet surface pushes the soil aside and leaves the green with an uneven putting surface.
- The routine practices of greens-airing, cultivating, and topdressing tend to create a disturbed putting surface as well as limiting the use of the course.

The Purr-Wick system for constructing and maintaining putting greens, however, minimizes the problems just mentioned — excess water, cultivation, and freezing and thawing.

William H. Daniel of Purdue University's Department of Agronomy began research for the Purr-Wick system in 1959 and has been heavily involved with promotion and development of it since. He also is currently executive secretary of the Midwest Regional Turf Foundation.

How it's done

The Purr-Wick system is designed for growing grass on a bed of moist sand above an impermeable barrier (plastic sheet), which serves to control moisture throughout the rootzone. The subgrade is constructed with the de-

"Purr-Wick eliminates the need to close

sired contour of the final surface. A series of internal vertical dividers are placed on 6-inch contours, which subdivide the green into buried compartments. Sheets of strong plastic are placed over the subgrade and dividers and extended to the outer surface. Edges of the plastic sheets are overlapped and taped to secure a waterproof lining. Each compartment has its own drain tubes (with narrow slits), its own flanges and seals so the drain exits at one edge and continues to a pit, where an adjustable upright riser gives maximum water conservation and provides for outflow of the excess.

Washed sand is compacted into and above each compartment to form a uniform, continuous surface. Peat and other additives are mixed into the top 1 to 2 inches of sand before the grass is seeded or sodded.

More than 100 samples of sand from around the United States have been tested (by dry seiving) as part of the research and educational services of the turf management program within Purdue University. The finer textured (0.1 to 0.5 millimeters) washed sands are preferred. Dune sands are very good for this purpose, due to their uniformity. Those sands with some larger coarse fractions (above 0.5 millimeters) included are less stable and less useful. Any sand can be used for the rootzone, but the finer 10 percent of the particles within the sand determines the amount of effective pore space and the depth of the sand bed to be constructed. In general, rootzone depths of from 16 to 24 inches above the barriers are prescribed.

What it does

Purr-Wick offers a water management system that provides a consistently moist sand rootzone, stabilized by turfgrass. It provides maximum control over extremely dry and or wet conditions. The system utilizes the principle of capillary action at low soil moisture tensions and permits control of the necessary, but variable, factor: soil water. Purr-Wick provides a rooting matrix which uses the large pores of compacted particles (sand) above an impermeable underlay. The surface of the porous sand rootzone remains playable as it adsorbs rain and surface irrigation water quickly, minimizing surface ponding.

The capillary action of sand will move moisture from the reserve area to the active rootzone as needed. Reservoir water will move upward through the sand, based on the scientific principle of "surface tension." The drier particles of sand will attract moisture until all are evenly moist.

The plastic liner or barrier and the vertical dividers on contour are essential to the system. These serve to retain the soil water reservoir of each compartment at the low tension needed within sands.

The conservation of rainwater, the complete use of any applied irriga-

BELOW: Dividers follow contour lines, slope at edge of green. BELOW RIGHT: Sand being spread over the plastic barrier.

he course because of excess rain."

tion water, and constant redistribution by low-tension water movement above the barrier provides the opportunity for uniform plant growth.

Under Purr-Wick management, the cultivation of a green is minimized or eliminated, for the sand rootzone provides a uniform, compacted surface. Light topdressing with fine sand is done frequently to maintain a smooth and "true" surface. The application of the sand topdressing is a fast procedure so minimizes interference with play on the course.

The sand bed of a Purr-Wick system adsorbs water (rain or irrigation) rapidly. It eliminates the need to close the course because of excess rain. The sand remains firm because the excess water is quickly dissipated through the sand. No water is left standing in the cup. Following rain, the green plays the same as before the rain, because the moisture content remains constant.

The freezing and thawing problems are minimized with the Purr-Wick system. Freezing causes less expansion in sand than in soils. The sand base requires less rolling and spring preparation than rootzones containing soils. Footprinting created by winter play is minimized. Any damage done is easily corrected by rolling and sanding.

The Purr-Wick system aids the golf course superintendent in keeping the course ready for use. The putting greens are constructed so that the drains from each compartment can be observed and thus provide a guide for accurately determining the water needs of the green. This eliminates the use of excess water. (The experimental Purr-Wick plots at Purdue University required a recharge of water not more than four times during the year. In contrast, the adjacent plots [non-Purr-Wick] required more than 40 waterings per year.)

The available water within the rootzone of a putting green is constantly adjusting, which eliminates dry spots that normally require syringing and hand watering. Turf managers enjoy maximum freedom in scheduling work on a Purr-Wick green.

Sands are not noted for holding nutrients for extended periods. Purr-Wick management minimizes this by retaining dilute solution of nutrients above the barrier. Modern fertilizers that offer slow release such as IBDU and Ureaforms aid in providing a uniform growth pattern on the moist sands.

The first Purr-Wick green was built in 1968. Now there are more than 300 golf greens plus many tees, flower beds, vegetable beds, and roof gardens that utilize the principles of the Purr-Wick system. More than 700 systems are in use in 30 states and Canada.

In an effort to find a way to keep his public course open for play more days of the year, Bob Hamilton of Evansville, Ind., build 36 putting greens with the Purr-Wick system. His customers know the course will be open anytime they wish to play.

Courses in the Denver area, where they have variable weather of intermittent windy warm periods between periods of freezing temperatures, have found the Purr-Wick system to be

helpful in dealing with the drying conditions produced by such weather.

Superintendent Don Parsons of Knollwood C.C. in Los Angeles County has built a Purr-Wick practice green in an effort to reduce the amount of water utilized. His records indicate a one-third saving of water for a total season, compared to the adjacent, conventionally built greens.

Research at Arizona University showed that sand above a barrier could retain water from a single recharge for 3 weeks to 3 months, depending on the local weather.

Gene Baston, superintendent of the Country Club of Birmingham, Ala., chose to install Purr-Wick greens to minimize the water problems resulting from severe thunderstorms in that area.

The costs for Purr-Wick construction vary according to location and conditions. A recent report is that of 50 to 60 cents per square foot for materials and labor — not including rough grading and irrigation installations.

Developments in the plastics industry have provided excellent materials for use in constructing Purr-Wicks. A double-layered, high-density 4-mil plastic sheet (Tutuf by Stocote Products, Inc.) has proven better than the 10-mil thickness of standard plastic sheeting. A 2-inch plastic drainage tubing with 90 openings (narrow slits) per foot (Turfflow by Hancor, Inc.) can be buried directly under the sand fill. Outflow control pits can be constructed by using corrugated walls and preformed lids.

The vertical dividers can be made from sheets of fiberous outside house sheathing. These are cut into 14- to 20-inch widths and staked vertically along the contours. Dividers may also be made from 1- by 4-inch boards supported by stakes to the height of the final sand fill. When the sand is in place the plastic is cut and the boards and stakes are removed, leaving the internal plastic barriers extending to the surface.

Purr-Wick can be constructed quickly and planted immediately. This is an important factor when rebuilding greens on an existing golf course. Tees are usually constructed as one large flat unit with one outflow control.

The Purr-Wick system provides uniform playing conditions, ease of maintenance, and economy and control of water. □

FOR FURTHER DETAILS

The name "Purr-Wick" is derived from *Plastic Under Reservoir Rootzone with Wick* action. Golf course operators and superintendents can get more complete information on the system by requesting *Purr-Wick Rootzone System for Turf* (MRT leaflet No. 40) from **Turf Research, Department of Agronomy, Purdue University, Lafayette, IN 57907.**

BELOW: Equipment should stay on top of the pile and off of the plastic barrier when spreading sand.