

Poor fairway/rough drainage at Sahalee Country Club

Geographic location: Seattle, WA

Turf species at the problem location: All cool-season grasses,

Turf type: fairway, Rough

Brief description of the problem: Golf course soil is primarily comprised of heavy clay and silt with rocks from glacial activity. Minimal drainage was installed at the time of construction. Originally seeded in the early 70's with Kentucky bluegrass; however, quickly changed to interseeded bentgrass and *Poa annua*. *Poa annua* is the dominant turf today as large firs surround the course. The membership refuses to address the tree issues, thus the fairways and roughs were always wet for nine months and difficult to maintain in the summer due to heavy thatch and soil. Fairways and roughs were unmowable during this time.

What actions were taken to correct the problem? Miles of drainlines were installed during the 70's and 80's to move excess water from the site; however, the course remained wet between the lines. Aeration was completed regularly although little soil could be brought to the surface due to rocks. Vertical mowing was conducted yearly to reduce thatch; however, the thatch was in excess of 2 inches and was very acidic, as was the soil. Liming was completed on a regular basis, but this had little effect on the thatch. After attempting all of the previous programs for over 15 years without significant results, a decision was made to deep tine over 10" in depth; however, this resulted in a deeper "bathtub" and did little to aid in winter conditions. Finally, the start of fairway or wet area topdressing was started in the early 90's.

The course was divided into three priorities. Those areas that were completely hopeless and small had the soil removed, drainage installed, sand backfilled and seeded. The highest priority fairway and rough areas received heavy sanding (at one-eighth inch) every 7-10 days from May-September with a USGA greens grade sand. This lasted for two years and resulted in slightly over two inches of accumulated sand. The last priority areas received occasional sanding and received a total of one-half inch over two years. After player complaints, the rate was dropped to two one-quarter inch applications in the spring and fall of 1993 and covered the entire golf course, including the roughs.

What was the rationale for this action? The use of sand had proven very beneficial on the greens, tees, traffic areas and aprons. In every case, thatch degradation was enhanced and the surfaces stayed firmer throughout the year. The addition of sand over an extended period of time would then allow for regular aeration without striking rocks as sand accumulated over the soil to an eventual depth of 5-6 inches. The membership wanted a year-round dry golf course without massive reconstruction.

What results were expected? It was expected that over time the fairways and roughs would become drier longer in the fall and earlier in the spring. As more drainage was added it was also expected that the course would become far more playable in the winter. It was also known that the irrigation heads would require frequent leveling and extra mower reels would be necessary.

What other actions could have been taken? All of the large wet areas could have been reconstructed with sand and seeded.

Why was it decided not to do these things? This method was undesirable to the membership due to high initial cost and disruption to the course.

What were the results of the action taken? The results have exceeded expectations. While in-ground drainage is still required in several areas, the golf course is now a year-round facility. The fairways can be mowed as needed in the winter without damage, lost golf balls in the mud are a thing of the past and the membership is in full support of the topdressing program.

Did it solve the problem? Absolutely! The 1998 PGA Championship was conducted at Sahalee with the best players in the world giving the fairways and roughs rave reviews.

Were there any unexpected results? Several including:

Root systems going from 1" to 4-5" - with *Poa annua*!

Less dry spot problems due to thatch reduction and deeper root systems.

Allows players to drive power carts on the roughs and fairways much longer in the fall and earlier in the spring.

Allows regular fairway and rough mowing year-round without tire tracks and stuck vehicles.

Greatly improves overseeding effort due to thatch reduction at surface.

Case was obtained from the case database managed by Dr. Al Turgeon, Penn State University.
(<http://turfgrass.cas.psu.edu/caselibrary>)