USGA GREEN SECTION RECORD

VOLUME 52, NUMBER 15 | JULY 25, 2014


## CONSERVING WATER THROUGH FAIRWAY AND ROUGH CULTIVATION

**IMPROVING WATER INFILTRATION PROVIDES SIGNIFICANT BENEFITS TO A WATER-CONSERVATION PROGRAM**

*Patrick O'Brien, director, Southeast Region*

Hollow-tine aeration of fairways and roughs remains the "gold standard" to relieve soil-compaction issues. Debris cleanup makes this a tedious process.

Water is precious. Every drop counts. Tremendous effort, expense, and sophisticated technology are used to move water from its source to the turf, but sometimes water does not want to stay where it is applied. Oftentimes water may run off the intended site to an adjacent area that may not need additional water. This can result in areas that are alternately too wet or too dry; both of which conditions are stressful to the turf, the superintendent and the water budget.

The focus of this article is minimizing water runoff on the golf course. The causes of runoff will be reviewed and an economical solution using solid-tine aeration or deep slicing will be introduced.

**Why Water Runs Off Compacted Soils**

Soil compaction is an enemy of water-conservation programs and impairs soil structure. Runoff occurs on compacted sites when soil macropores – or small channels in the soil – become sealed. Without proper water infiltration, compacted soils in fairways and roughs often remain dry even after irrigation or rain events. The dry soil conditions caused by compaction-diminished infiltration rates can increase turfgrass stress, and additional irrigation water targeting the dry, compacted sites is likely to run off into nontarget areas. Furthermore, turfgrasses grown on compacted soils have shallower roots, placing the turfgrass under additional stress.

**Cultivation is the Answer**

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## WINNING STRATEGIES TO OVERCOME ADVERSE SOIL CONDITIONS

**IMPROVING THE ROOTING ENVIRONMENT OF NEARLY IMPERMEABLE SOILS IRRIGATED WITH RECLAIMED WATER**

*Brian Whitlark, agronomist, Southwest Region*

Black layer has developed near the surface in this sand channel due to organic matter accumulation.

Golf facilities built in north Scottsdale, Ariz. offer some of the best playing conditions in the country for much of the year and attract winter visitors from many domestic and international locations. The golf industry in Arizona yields an annual economic impact of 3.4 billion dollars (**Economic Impacts and Environmental Aspects of the Arizona Golf Industry**) and employs more than 20,000 people locally. Additionally, Scottsdale is the top ranked "Golf-Home" market in the west as identified by Golf Digest.

In an effort to conserve precious water resources, the golf courses in Scottsdale converted to using recycled water that contained elevated salt levels when compared with groundwater or water delivered from the Colorado River. The recycled water, in combination with adverse soil conditions, eventually led to poor-quality turf where salts accumulated. The net result was decreased revenues and increased inputs to try to alleviate the situation, ultimately affecting the facilities' profit margins.

In this article we will investigate methods several facilities have employed over the past decade to overcome poor-quality irrigation water and adverse soil conditions. Note that while this article focuses on the challenges in a specific part of the country, the concepts of managing fairways with poor-quality water under the most demanding of conditions are universal.

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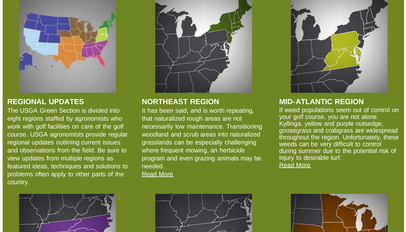


Water is the world's most precious resource, vital to sustaining all life, and it is our responsibility to conserve and protect water. The golf industry is dependent upon water; therefore, it is critical to ensure golf course water use is managed efficiently and effectively. The USGA has taken a multifaceted approach involving research and education to promote water conservation within the golf industry. This video highlights those efforts and the importance of water conservation on the golf course.

For more information on golf's use of water and ways golf courses can conserve water, visit the new USGA Water Resource Center. The site contains information for golfers, communities, and golf facilities and now includes an interactive map featuring water-conservation case studies, best management practices and drought-contingency plans across the United States.


One of the positive outcomes of the USGA Turfgrass and Environmental Research Program has been the successful development of breeding programs for warm-season turfgrasses. With funding from the USGA and the U.S. Department of Agriculture, researchers in Texas, Georgia, Oklahoma, North Carolina and Florida have tested hundreds of varieties of warm-season grasses for drought, salinity, shade and cold tolerance. Now nearing completion of the fourth year of the study, three new bermudagrass varieties and more than 10 new zoysiagrass varieties have been entered into the 2013 National Turfgrass Evaluation Trials.


Rolling has become a regular part of most maintenance programs - particularly on the greens. However, rolling is certainly not a new idea. Early golf course superintendents used rollers to smooth out hoof prints of their primary source of mowing power - horses and mules. This advertisement for a steam-powered roller ran in the 1898 issue of "Golf" published by the USGA.

## REGIONAL UPDATES



**REGIONAL UPDATES**

The USGA Green Section is divided into eight regions staffed by agronomists who work with golf facilities on care of the golf course. USGA agronomists provide regular regional updates outlining current issues and observations from the field. Be sure to view updates from multiple regions as featured ideas, techniques and solutions to problems often apply to other parts of the country.



**NORTHEAST REGION**

It has been said, and is worth repeating, that naturalized rough areas are not necessarily low maintenance. Transitioning woodland and scrub areas into naturalized grasslands can be especially challenging where frequent mowing, an herbicide program and even grazing animals may be needed.
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**MID-ATLANTIC REGION**

If weed populations seem out of control on your golf course, you are not alone. Kyllinga, yellow and purple nutsedge, goosegrass and crabgrass are widespread throughout the region. Unfortunately, these weeds can be very difficult to control during summer due to the potential risk of injury to desirable turf.
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**SOUTHEAST REGION**

One of the great aspects of the turf industry is the willingness among professionals to share information. Recently, approximately 30 superintendents convened in Memphis for two days of education on ultradwarf bermudagrass surface management that will help golf facilities throughout the Southeast produce outstanding playing conditions. Ultimately, it is the golfer that benefits.
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**FLORIDA REGION**

Aggressive cultivation practices are causing courses throughout the region to develop a temporary brown hue. Although frustrating to summertime golfers, this regional update reveals the importance of cultivation practices in Florida.
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**NORTH-CENTRAL REGION**

It's just one problem after another for *Poa annua* in the North-Central region this season. This regional update serves as a reminder that even though we are no longer coping with severe winter conditions, summer-related stress issues continue to pose a threat.
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**MID-CONTINENT REGION**

If you want to learn a lot about how to do with less water it only makes sense to travel to places where water is extremely scarce and expensive. And, if you want to learn a lot about how some of the country's best golf courses have adapted to huge reductions in water availability for turfgrass irrigation, it only makes sense to head west.
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**NORTHWEST REGION**

As the final chapter of the U.S. Women's Amateur Public Links Championship is written, see how The Home Course in DuPont, Wash., was up to the challenge of achieving firm and fast conditions with a staff size of just 12 (plus a few volunteers).
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**SOUTHWEST REGION**

"The greens are rolling a "sticky" 10." Is a "sticky" 10 different from a "regular" 10? Despite such perceptions, Stimpmeter readings do not lie and green speeds are the same regardless of moisture content in the greens.
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The USGA Green Section Record (ISSN 2156-5813) is published biweekly via electronic mail by the United States Golf Association®.

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