

## A New Sodicty Index for Improving Risk Assessment and Management of Saline and Sodic Soils

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There is no bigger challenge facing the golf industry than water use. We believe that one day, use of potable water for golf course (and landscape) irrigation will be considered indefensible, even in water-rich parts of the world. This means that alternative sources of potentially poor water quality will become the norm. Alternative sources of irrigation include primary, secondary or tertiary effluent and harvested water from surface runoff. These sources have considerable spatial and temporal variation in their chemical composition. A plethora of management guides can be found for using poor-quality water for turfgrass irrigation; however, very little research has been conducted as to how the specific water quality parameters affect golf course soils. We recently discovered flaws in the SAR and SARadj equations which lead to inaccurate assessments of sodic hazard and faulty recommendations. For this project, we will test a new equation that corrects the flaws of the previous equations using an experimental approach in the laboratory that allows us to observe exactly what happens to saturated hydraulic conductivity as sodium and salinity levels change during evapo-concentration. The results of this research are expected to demonstrate a more accurate way of estimating sodic hazard and will improve our understanding of and ability to assess poor irrigation water quality in golf course soils.

In 2015, we focused on identifying golf courses that had soil types that would be ideal for testing using the University of California Davis Soil Web <http://casoilresource.lawr.ucdavis.edu/gmap/> and the USGS national water information system <http://maps.waterdata.usgs.gov/mapper/index.html> to identify where in South Dakota well water sampled had high sodium content. With these tools we narrowed down the golf courses we wanted to sample to six courses including Lee Park Golf Course (Aberdeen, SD), Olive Grove Golf Course (Groton, SD), Britton Country Club (Britton, SD), Leola Country Club (Leola, SD), Medicine Creek Golf Course (Presho, SD), and Fish Lake Country Club (Plankinton, SD). From our soil maps we determined the best possible locations to take five 1 m deep soil cores of two inches in diameter from each course. We did this with a truck-mounted Giddings soil probe. We also obtained five gallons of irrigation water from each course. Soil and water samples are being kept at 4°C in a walk-in cooler prior to hydraulic conductivity testing which will begin in early 2016.