Evaluation of Soil Health Through Long Term Chemical Applicants on Golf Course Fairways Watered With Poor Quality Water

Chaloupka, Aaron (School: Christ the King Cathedral School)

Turfgrass is a perennial ground cover adapted to withstand persistent mowing and all traffic. Light, water, humidity, climate, soil conditions and season, are key factors in selecting a turfgrass species to maintain health and playability expectations. Supplemental irrigation is required for management in semiarid climates, but diminishing water quality is raising concerns about the effects of high salt content on turfgrass and soil health. In this project, the long-term effects of topical chemical applications to a golf course fairway were evaluated to improve soil characteristics and health. Treatments of hydrochloric acid followed by hydrogen peroxide at a 1x and 2x rate, humic acid in granular and liquid form were applied topically. Soil samples were collected initially before each application period, and after each treatment period. Golf course fairways received evaluation from July 2021 until August 2022. The hypothesis was not supported. Topical treatments provided minimal differences overall in soil analysis. Soil pH changes occurred positively initially, but were very inconsistent. Soil EC did not differ with chemical treatments, but mean soil EC was different for the sampling dates with rainfall events being the biggest driver of these changes. Both characteristics are most likely caused by time of evaluation and impacting environmental factors. Organic matter provided more consistent results, averaging around 1000, which is normal. Devising chemical applications, through water testing and soil testing, will provide a stable means of management for golf course management to target practices. Managing financial burdens and irrigation concerns furthers precision agriculture, to maximize yield, and reduce inputs.