

THE EFFECTS OF SODIUM ON TURF



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The soil at Apple Creek Country Club is classified as sodic soil. Sodic soil as described by James S. Beard in his book TURFGRASS: SCIENCE AND CULTURE is "soil having an exchangeable sodium percentage greater than 15 and/or a ph of 8.5 or higher. Sodic soils contain sufficient sodium to interfere with turfgrass growth or quality. The effects of sodium become dominant in sodic soils due to the absence of calcium and magnesium. This occurs when sodium composes more than half of the soluble cations in the soil solution and becomes the predominant absorbed cation on the soil colloids. The dominance of sodium impairs flocculation and causes deterioration of soil structure. Sodic soils are characterized by a relatively coarse textured, thin surface soil zone. Beneath is a dense layer of clay accumulated from the horizon above, which has an extremely low water permeability".

Apple Creek C.C. has all of these conditions. To make matters worse, half of the course has a high water table and the water that is used for irrigation is drawn from a creek that has a high sodium content.

The first order of business was to engage a soil engineering firm that does extensive work with this type of soil condition. They drew up a master drainage plan which included surface and internal drainage. A seven year plan was adopted to effectively fund and complete this

project with minimal interruption of play.

The next priority was the aerification of the greens, tees and fairways. Greens and tees are aerified twice a year with a Greens Air II using a homemade 1" tyne. We use a large tyne to remove as much soil as possible and replace it with sand. It takes 6-7 1/2 tons of sand per green for each aerification.

Fairways are also aerified twice a year. The Greens Air II is used on the worst fairways. This process is slow, but it works well. The remaining fairways are aerified in two directions with a fairways aerifier. Plugs are removed and sand is applied to the worst fairways at 25-30 tons per acre for each application. Gypsum and sulfur are added to all aerified areas both in the spring and the fall.

In summary, Apple Creek C.C. has four major problems. They are a high ph factor, a high exchangeable sodium percentage in the soil, a high cation exchange capacity (CEC), and a high exchangeable sodium level in the irrigation water.

To correct these problems the following procedures are being implemented:

- 1) Drainage projects to leech down the soluble salts.
- 2) Sulfur application lowers the ph level.
- 3) Gypsum takes the place of sodium in the soil which in turn will lower the ph and lower the CEC.
- 4) Sand topdressing applied to the greens, tees and fairways improves the soil structure.

We are continuing to use water from the creek for irrigation; however, future plans include a well, which will eliminate this additional source of sodium.

APOLOGIES

Due to a malfunction of our camera (the operator wasn't too good, either) many of the pictures taken at the Turf Conference did not survive. Our apologies to the main speakers, the prayer meeting participants and others whom we were not able to show in this issue.