

# Soil Physical and Chemical Characterization of Aging Golf Greens

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## Objectives:

1. Determine temporal term effects of a USGA specification rootzone mix with and without soil on physical and chemical factors

Start Date: 2001

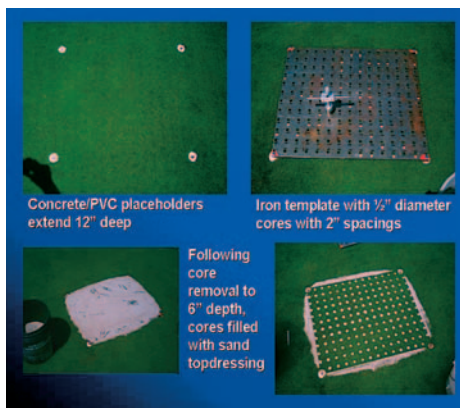
Project Duration: five years

Total Funding: \$109,285

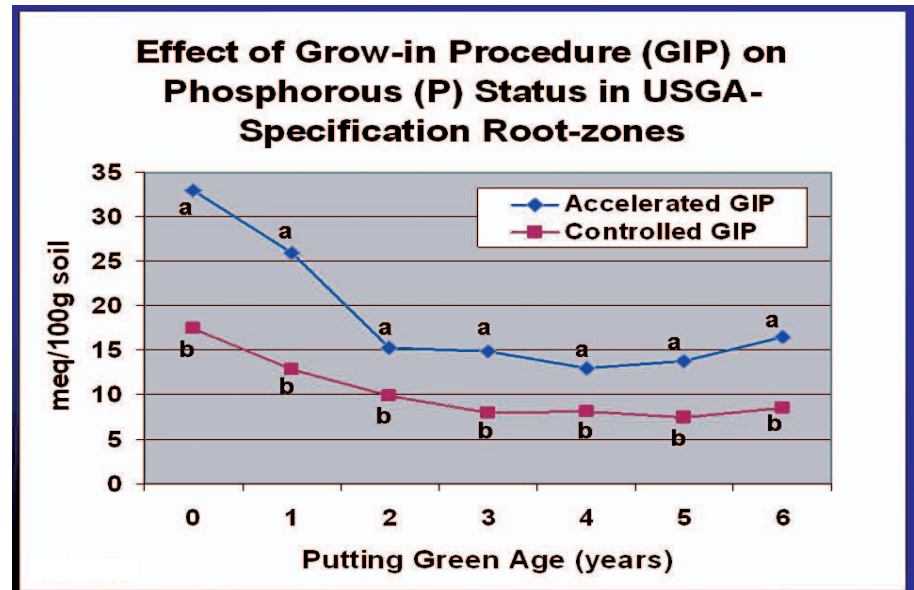
The five-year project is a focused extension of the previous USGA project-Grow-in and Cultural Impacts on USGA Putting Greens and their Microbial Communities. Emphasis is being placed on characterization of the long-term effects of rootzone mix on soil physical parameters, specifically saturated hydraulic conductivity, total and air-filled porosity, and bulk density.

Data have been collected for more than eight years on this project. Results to date indicate that as green matures, soil infiltration is not affected in the first two years after grow-in, decreases significantly in the third year after grow-in, and this trend continues for up to nine years after construction regardless of rootzone.

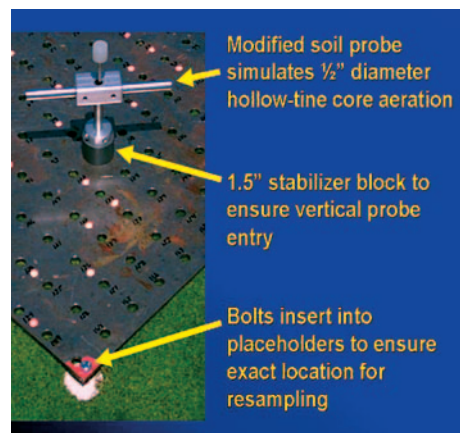
In an effort to explain these responses, extensive sampling was done in 2004 of the accumulated topdressing layer (i.e. the mat layer) on the surface of the rootzones and the original rootzone. In previous years, these visually different profiles were analyzed together. Initial data indicated that the light, frequent topdressing program results in an accumulation of approximately 0.25" of material per year and that this material is significantly high-



Extensive sampling was done in the accumulated topdressing layer (mat) with the aid of an iron template.



Rootzone phosphorus levels reflected significant differences due to the higher level of phosphorus applied with the accelerated grow-in procedure.



Using the iron template, a modified soil probe was used to simulated 0.5-inch diameter hollow-tine core aeration.

er in organic matter than the original rootzone.

These data are currently being analyzed with other data to better explain the change in rootzone physical properties over time. Research is also being conducted to compare and contrast the organic matter present in the original rootzone versus that of the accumulated mat layer.

## Summary Points

- University of Nebraska researchers are characterizing the long-term effects of rootzone mix on soil physical and chemical parameters.
- Results to date indicate that as green matures, soil infiltration is not affected in the first two years after grow-in, decreases significantly in the third year after grow-in, and this trend continues for up to nine years after construction regardless of rootzone.
- Light, frequent topdressing results in an accumulation of approximately 0.25 inches of material per year and this material is significantly higher in organic matter than the original rootzone.
- After the establishment year, regardless of grow-in fertility, all nutrients stabilize, except for phosphorous that remained high in the accelerated grow-in treatment plots for several years after establishment.
- Research is being conducted to compare and contrast the organic matter present in the original rootzone versus that of the accumulated mat layer.