



Management Systems for Creeping Bentgrass Putting Greens: THE WISCONSIN STUDY

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Background

I have been fortunate in my life to find a career that I thoroughly enjoy. I am able to give of myself in ways that many who dread their work cannot. Since my arrival, almost 2 years ago, I have cherished the emphasis my colleagues (Kussow, Koval, Meyer, & Mackintosh) and I have placed on teamwork. We refer to ourselves as the UW-Turfgrass Group, each of us bringing unique perspectives and experience that creates a special environment for research and education. The following research project is our first group effort with the entire team in place and with the support of the WGCSA.

Perspective

The most common criticism of turfgrass research is; *studies that isolate one, maybe two, management factors and maintain other inputs at constant levels don't relate to real world situations.* The single factor approach enables the researcher to identify the specific influence of individual components of the management system. For example, if I wanted to know the effect of different mowing heights on bentgrass rooting, I would select 3 to 5 different heights of cut and set fertility, irrigation, cultivation, topdressing and pesticide use at constant levels. I would replicate my experiment so as to account for variability in plot location and any effect of a chance occurrence, collect and analyze the data, then report the findings.

The advantage of this approach is that it provides precise information regarding the contribution of one factor to the entire management system. Still, what if you irrigate and fertilize differently than the levels used in the study? I could vary several factors at a time, but then, logistically it is difficult to conduct the work and determine

absolute effects. Therefore, one must recognize that all research has limitations and needs careful interpretation to determine actual effects in a specific management system.

Thinking of all the components of a management system, we begin to realize how many decisions are made to attain specific aesthetic and functional quality goals (see flow chart on cover). Also, from a research perspective, determining the impact of several management components simultaneously on measurable biological factors poses a unique challenge. With this in mind, the UW-Turfgrass Group is initiating a long-term study, on the WGCSA-funded experimental USGA sand-based and native soil (push-up) greens, to evaluate several putting green management systems.

Project Overview

Putting green management systems research involves setting functional & quality goals then designing management programs to achieve the goals. Our systems approach is based on classical long-term systems research techniques, group experience and from information gathered in the Putting Green Management Survey (Bob Erdahl; *THE GRASS ROOTS*, 1989).

The significant benefits of a systems approach is the inherent long-term nature of the study and the flexibility it allows when implementing various management tools—just as you would do on your putting greens. The study is divided into phases that address grow in (year 1), maturation (years 2 to 4), species transition (years 5 to 7) and species conversion and management (years 8 to 10). Each phase has functional goals designed to simulate several management intensities practiced at high budget, medium budget, and low budget

facilities on sand-based and push-up soil greens. Throughout the project the turf group will observe the progress and “tweak” the systems to maintain specified levels of functional and aesthetic quality. Additionally, as we evaluate the biological and ecological response of the green to the systems we might initiate separate single factor experiments to isolate individual effects. An important facet of the project is economics. To address the topic in general terms, time and cost estimates for each management system will be recorded regularly. These estimates could be used to determine relative efficiency based on the measured parameters.

The Grow-in Phase

Many superintendents will be involved in new construction or renovation that will require growing in a new putting surface on sand-based and push-up greens. We selected 3 bentgrass varieties that represent industry use, growth habits and performance in trials at the O.J. Noer Turfgrass Facility. Plots on each green will be seeded at 1 lb. (pure live seed) per 1000 ft² with Penncross as the *old-timer* with substantial lateral growth, Providence as the more widely planted of the new varieties, with moderate upright growth that scored high in our variety trial and Crenshaw as the *new kid on the block* with substantial upright growth, also scoring high in trials.

The major focus of the grow-in phase will be to evaluate the influence of 3 nitrogen (N) fertility strategies on establishment and any leaching of N through the profile. The latest *fad* in grow in philosophy is weekly or bi-weekly applications 0.5 to 1.0 pound of soluble N per 1000 ft² on sand-based greens and will serve as the basis for the high intensity manage-

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ment system. Two other systems are designed to fertilize with soluble and/or slow-release N applications based on demand for color or strictly slow-release N applied on a calendar schedule. Additional management factors will include the sandwich method of regular light topdressing while lowering the cutting height, as well as other medium and reduced intensity systems designed around the fertilization strategies.

To address the substantial pressure superintendents are under to open the greens for play, a traffic simulator has been constructed with over 400 golf spikes on two rollers. This apparatus will be used to impose wear at various stages throughout the grow-in phase. We anticipate providing support for holding the golfer off as long as possible, especially as we view the long-term effects of opening to early for play.

The Maturation Phase

Following the initial grow in season we will superimpose 3 levels of management over the 3 levels of establishment. For example, a high intensity management system that results in stimpmeter readings at or above 10 feet will be imposed over the weekly soluble fertility program (rapid grow-in—fast greens). This system will include mowing at or below 0.125", quad-tine cultivation, bi-weekly topdressing, preventative fungicide applications, plant growth regulators, etc.

The medium intensity system will be designed to provide stimpmeter readings between 8 to 9 feet and emphasizing wear tolerance.

The reduced intensity system is concerned with aesthetic quality and consistent roll with no speed requirements. Keep in mind that each system will be practiced on sand-based and push-up soil greens.

Status and Logistics

As a group we anticipate an open dialogue with the WGCSA regarding the status of the study with regard to specific management tools you may have found to be helpful. Please take some time and review the proposal you received at the spring business meeting and give us your input on the systems we designed. After all they are trying to simulate what you would be doing and can only be as useful as you help us make them.

As of this writing we are ready to install resin bags to collect any nutrient leaching below each plot and begin seeding. We are excited about the opportunities this study will provide for research and for training graduate students. We expect to garner more financial support from other associations throughout the region and begin to realize the potential of the Noer Facility. It is the center of turfgrass research and education and home of your UW-Turfgrass Group. 🍀

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