

Precision turf management is here!

Researchers at Michigan State University say new diagnostic and monitoring tools will help turfgrass managers match programs to specific sites.

By RON HALL/ Managing Editor

The concept of "precision turf management" has been around for many years, but technology has not been in place to make it a widespread reality. New monitoring and diagnostic tools being embraced by agriculturists but adaptable to turf promise to make precision turf management a growing part of the vocabulary of turfgrass managers.

This is significant to turfgrass managers at large sites such as campuses or golf courses because conditions are not the same at each particular area within that site. Conditions, in fact, can vary greatly across a site.

Localized problems

Problems such as drought stress, pests, disease, fertility, compaction and drainage are often site-specific rather than uniformly expressed over a management area. While current practices often treat such problems "wall to

wall," the spotty nature of management problems raises questions as to how these varying conditions can or should affect turf management practices.

Surprising variability

To illustrate this point at the Michigan Turfgrass Field Day in late August, Dr. Paul Rieke pulled soil/turf plugs from several different sections of the Robert W. Hancock Turfgrass Research Center at Michigan State University. The plugs, even from sites relatively close together, varied dramatically from a high organic soil (almost a muck)

to a compacted subsoil.

These wide differences probably aren't unusual. MSU turf students earlier this year visited a golf course near their campus and took soil samples of a single golf hole.

What they discovered was pretty dramatic. They charted clay contents ranging from 5 to 30 percent, organic matter ranges from 2 to 9 percent, and water content and field capacity ranges from 12 to 26 percent. Tests for potassium revealed ranges from 137 to 380 lbs.

K per acre, and phosphorus from 27 to 260-plus lbs. P per acre—all on a single hole!



Turf and soil conditions often vary widely, even on a single golf course, explained Dr. Paul Rieke.



Dr. Fran Pierce said technology is available for turfgrass pros "to manage anything, anywhere."

"Is there variability out there?" Rieke asked rhetorically. "Of course there is. The question is, when we have variability what do we do with it?"

Tools will help

Traditionally, said Rieke, turfgrass managers rely on visual inspections and their memory of conditions to manage widely varying conditions under their care. However, this will change as turfgrass managers learn about and begin using more precise diagnostic tools.

"With the technology that we're using in agriculture today we can manage anything anywhere," added Dr. Fran Pierce, also at the Michigan Field Day. "The integration of a number of technologies is making this possible. We can assess and manage variability at levels of detail never before attainable and, if done correctly, at levels of quality never before achieved."

Pierce is a national authority on site-specific precision management in agriculture. He's working with Rieke and Dr. James H. Baird at MSU, to bring some of this knowledge to turf. □

New management technologies

► **Computers.** "The hardware is way ahead of us, but the software is a little bit behind right now," said Dr. Fran Pierce. Several companies are working on developing hardware and software to help turf managers adapt precision turf management, he added.

► **Global positioning systems (GPS)** to measure location. "If I'm going to measure variability I have to know where I am all the time and where I took the sample or found the problem," he explained. Using GPS technology, turfgrass managers can pinpoint a location within one meter very inexpensively, and down to a millimeter if they can afford it.

► **Geographic information systems (GIS)**, which Pierce described as "powerful spatial data analyzers.

► **Ground-based sensors.**

► **Aerial infrared imaging.** Pierce showed infrared images of the sprawling MSU turf research site. Some of the areas showed up green (healthy, growing), some yellow (turf under stress) and some blue (bare). "We can tell a lot about the condition of the turfgrass remotely," said Pierce.

Does an entire fairway need the same aeration or fertilization? Or does the entire green need the same topdressing or grooming program? Oftentimes the answer is no.

Precision turf management involves the precise application of turf management practices to localized soil and turf conditions. While many superintendents practice this now, they'll get increasing help from the growing number of tools that will allow them to assess and manage site specific areas.

Deere buys Player Systems; boosts 'precision' turf idea

John Deere boosted the concept of "Precision Turf Care" by acquiring Player Systems, the manufacturer of SkyLinks, a golf course management technology that uses the Global Positioning System (GPS). Deere made the announcement in late September.

Player System's technology was created four years ago and relies on GPS, a government network of satellites orbiting the earth. Player Systems is composed of two major components: Precision Turf Care and SkyLinks.

By combining its recently acquired GPS capability with personal computers, Deere is developing sprayer systems that apply precise amounts of control products at specific, preprogrammed sites.

Pin-pointing treatments where they're needed

"The accuracy of GPS can be leveraged into precision turf management," Shawn Phillips, Player Systems general manager, tells LANDSCAPE MANAGEMENT. "The great application of that would be precision spraying where a superintendent would go in and write a prescription for the course, or a certain area of the course.

"The superintendent knows where the traditional trouble areas have been, or where he has had troubles and where they show up first; for instance grubs,"

Phillips adds. "So, when the superintendent sees signs of grubs, instead of having to communicate this to everyone who operates a sprayer, he tells his computer to 'talk' to the sprayer, the very next time it goes out, to spray for grubs at those sites. The equipment does it on location."

Phillips says the technology will give superintendents more control and responsibility over their spraying programs. It will also allow them to more accurately track and record chemical product use.

Deere taking one step at a time

Phillips tells LM that Deere is carefully approaching precision turf technology. "We're taking a look at the existing machine population and adapting it

to the new technology," he explains. Most of this new technology centers around the sprayer control modules.

In addition to precision turf care, the Players Systems' SkyLinks should benefit golfers and, also, golf course managers. For instance, a SkyLinks mounted on a golf cart acts as an electronic caddy, conveying information about specific holes, including yardage and playing tips. It can also be used to send messages from clubhouse to cart and vice versa.

SkyLinks will retain its brand name but will fall under the umbrella of the John Deere Commercial and Consumer Equipment Division.

Precision turf management steps

1. Assess variability. Sample grid or zone.

Use sensors.

2. Manage variability. Make site-specific recommendations. Control application.

3. Evaluate control. Map performance. Do site-specific research.