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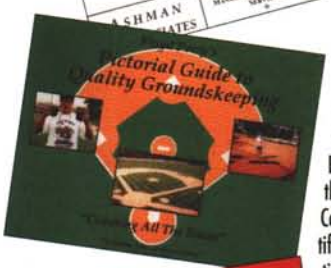
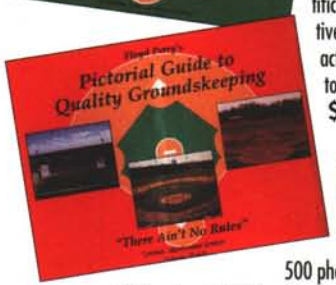
Lawns: Basic Factors, Construction, and Maintenance of Fine Turf Areas Third Edition, *by Dr. Jonas Vengris and William A. Torello.* Designed as a textbook or a practical usage manual , this book has been completely brought up-to-date. Care of lawns and turfgrass, from selection of varieties to maintenance of established grass is completely covered. A needed tool for gardeners, nurserymen, county agents, landscape designers, and a text for college turfgrass courses. This is the most up-to-date book on turf management available today. 195 pages **4128 $15.50**



Sports Turf Management Program—Maintenance & Renovation Planning Guide, *by Ashman & Associates.* This manual was developed to provide a coherent plan for the management of the baseball field playing surface and provides operational guidelines for the grounds crew to use as part of the maintenance plan. Enhances the "playing conditions" of the field by elevating the maintenance standards to the highest level possible. Complete descriptions of the maintenance protocol and identification of key issues to be discussed before starting objective maintenance procedures. This book provides a plan of action outlining the tasks to be completed and benchmarks to measure the progress of the program. 160 pgs. **4024 $105.00**



Pictorial Guides to Quality Groundskeeping Book I and Book II, *by Floyd Perry.* The only textbooks on the market for the grounds supervisor, athletic coach, little league volunteer, or baseball purist. Over 500 photos in each text with many in color. Book One, "Covering All The Bases" (100 pgs) covers Mound and Home Plate Repair; Edging, Dragging, Lip Reduction; Water Removal; Homemade Equipment and Tricks of the Trade. Book Two, "There Ain't No Rules",(108 pgs.) covers Football, Soccer, Softball, Little League, Minor League, College and High School Facilities. Also covers Curbside Appeal; Tricks of the Trade, New Ideas for Easy Maintenance; Professional Research from Higher Learning Centers and much more. **4008 - Book I 4009 - Book II $36.60 ea. or $69.90 - 2 bk set.**

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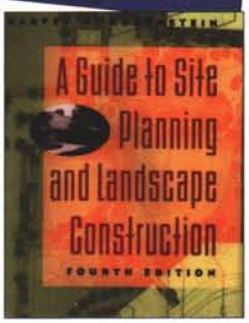

Golf Course Architecture Design, Construction & Restoration, *by Dr. Michael J. Hurdzan.* Described as "the modern bible of golf architecture," the book chronicles all facets of designing, building, renovating and restoring a golf course. Explains tee, green and bunker construction, turfgrass establishment and maturation, as well as drainage and irrigation trends and techniques. 326 color photographs and 80 course maps and drawings. 424 pgs. **4037 $75.00**

Controlling Turfgrass Pests, 2nd edition, *by T. W. Fermanian, M. C. Shurtleff, R. Randall, H. T. Wilkinson, and P.L. Nixon.* This book concentrates on the diagnosis, fundamental biology, and control of turfgrass weeds. Demonstrates how to identify turfgrass pests, when and why they occur , the damage that may take place, the life cycles of the pest, plus culture, chemical and other management strategies designed to keep pest damage to a minimum. 720 pp. **4031 $85.00**

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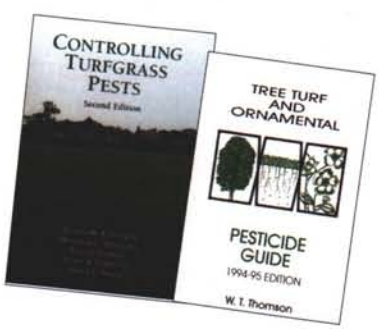

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Analyzing Your Records — What Worked? What Didn't?

By Dr. Gil Landry

The demand to do more with less is a fact of life in the turfgrass industry. The best way to cope with increasing pressures to produce better results, despite limited resources, is to increase the efficiency and effectiveness of your programs.

Change always starts with analysis. Establishing and maintaining a comprehensive record-keeping program gives you the data to analyze. While a good manual record-keeping system can be effective, computers make record keeping faster and easier, and provide rapid access to data. Whatever system you choose, systematic, accurate data entry is an essential part of the process. Let's face it — good records show professionalism.

Sports turf management is a complex job in part because maintenance procedures are impacted by field use and weather conditions. The better your records of all three of these components the easier it becomes to evaluate any interactions and make adjustments for next year's field maintenance program.

Establish a Baseline

A good sports turf management record-keeping program begins with complete data on the areas to be maintained. If you haven't done so already, develop a map or grid layout of all the areas within your program. This may be a simple series of blocks on the computer screen with maintenance areas highlighted or lines drawn out on the developer's plot plan for your facility or an enlarged version of a city map.

Then sketch out each individual area and note the pertinent details of each specific area. For example, the maintenance areas might include stadium surrounds, a sand-based turfgrass game field, multiple native soil or amended native soil outdoor turfgrass practice fields and an enclosed artificial-surface practice field. The landscaped area surrounding these fields, the parking lots, and the buildings also could be within the maintenance program.

In this example, the high-wear areas of each of these fields would receive a higher level of maintenance than the lesser-used portions of the fields. The sand-based, amended-soil and native soil fields also would have different maintenance plans. General turf within the landscape, the trees, shrubs, flower beds and other landscape features would have still different maintenance needs.

Once you have a complete picture of your maintenance areas, the different categories or levels of maintenance become more obvious. The overall maintenance program would then include adaptations to accommodate the needs of the different categories.

Some sports turf managers assign a number or letter of the alphabet to each different maintenance category and refer to those letters or numbers when making crew assignments. The landscape turf might be category G, the lesser used areas of a practice field category E, and the high-wear areas category D. Crews might be asked to aerate D and E, but only to overseed and topdress D.

Track Data

Use the basic grid to track your maintenance program. Records need to cover such basics as what you did, and when and how you did it. For example, your crews applied fertilizer to the football game field in early August. At a minimum, your records would indicate:

- the specific area where the material was applied (which field and what part of that field);
- the date and time of application;
- the authorized (and licensed if need be) crew member who made the application;
- the specific product applied — including the manufacturer name, product name and product formula (such as 10-18-22 for a fertilizer product);
- the rate of application (including the pounds of N, P and K applied per 1,000 square feet for a fertilizer product).

Recording additional information gives you more pieces of the puzzle. Such details should include:

- the condition of the field prior to application,
- weather conditions at the time of application (wind speed and direction, temperature, humidity level, or evapotranspiration [ET] readings if you have them),
- pre- and post-application procedures,
- pre- and post-application irrigation details (timing of irrigation cycles, amount of water applied, and at what rate).

Ideally, you'll have daily ET records for review. If not, consider recording the temperature, humidity level, prevailing wind conditions and precipitation amounts (including when that precipitation occurred and if it fell as rain, snow, sleet) on your daily calendar. Do note at least the temperature low, high and average for the day.

Keep records of pre- and post-game procedures. Here, Don Follett paints a center-field logo at the Washington Redskins' new Jack Kent Cooke Stadium. Photo courtesy: Trusty & Associates.

You'll also want to record field-use schedules including who used which field when, how long and for what. Here again, the more complete the records, the better. Obviously, a peewee soccer team practicing on the field for two

At a minimum, record where materials were applied, who applied them, the time of application, the specific product and the rate.

hours on a rainy Saturday morning will produce less damage than a high school or college team practicing on the same field during the same time period.

Add your own assessment of field conditions to your records: the percent of turf cover, turf density and color, and the amount of clippings being cut. You may be making field checks daily, weekly or bi-monthly, depending on the number of fields in your maintenance program. At each field check, you develop an assessment of actual conditions compared to your expectations. Develop a simple ranking system (such as 1 to 10) to correspond to that assessment and note the ranking in your records.

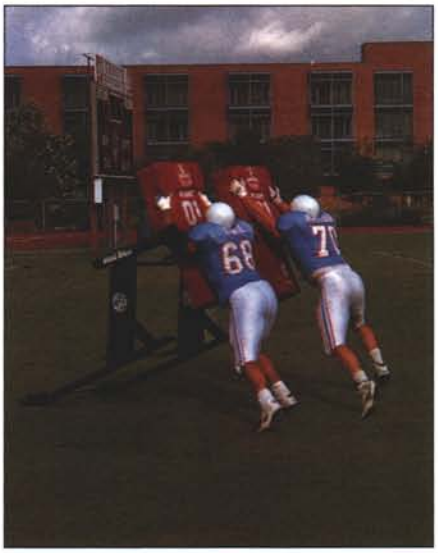
Analyze Your Records

Tracking all this information will give you some fairly definite patterns that will help in analyzing your maintenance program. You'll be able to determine that overseeding by date X produced playable turf by date Y under certain weather conditions. Additional aeration between the hash marks of the football game and practice fields kept the turf in good shape throughout the season. The fertilization skipped because of a tight budget showed up in reduced density on the heaviest wear areas of the fields.

Also note the exceptions to expected patterns. Determine why the exceptions occurred.

For example, in a parks or school system maintenance program, the fields used primarily by the younger players should have better turf conditions at the end of a sport's season if the type of soil profile, types of turfgrasses and irrigation systems are the same and the initial field conditions, level of maintenance and use schedules are comparable.

Suppose the turf of one field out of 20 youth soccer fields doesn't fit these expectations. You'll need to compare all the possible variables to find out why. Maybe this is the corner field in an open complex with greater exposure to wind so it dries out more quickly. Maybe it has a slightly greater elevation than surrounding areas and rainfall runs off before it penetrates the soil. Maybe this is the field nearest the parking lot, so most of the players and spectators walk over it on their way to and from other fields, increasing compaction problems.



In your field-use schedules, record who used which field when, how long and for what. The more complete the records, the better. Photo courtesy: Mike Schweitzer, Trinity University.

Specific sections of certain fields also may vary from the overall pattern. The turf in a corner section of a stadium-enclosed game field may have less density and less root development than the rest of the field. Maybe the shadow cast by the stadium keeps this turf shaded longer than the rest of the field. Air movement in that corner may be restricted, or it may be greater than in other areas of the field. Maybe the cheerleaders cluster in that area during especially hot or cold weather.

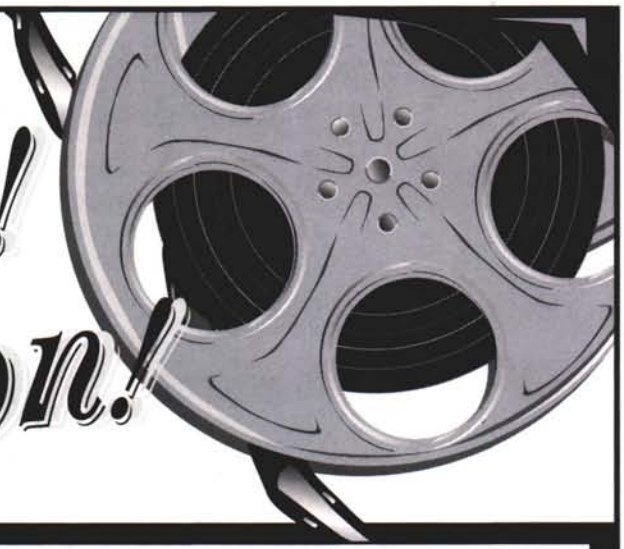
Changes in weather conditions or in field-use scheduling may alter the expected patterns of specific procedures in some, or all, of your fields. Maybe baseball team practices started a week earlier last spring, giving the turfgrass from the previous winter's dormant seeding less time for establishment. Maybe heavy rains during the last two football games of the season caused more damage than could be repaired before winter snows started. Maybe a soccer tournament was moved to your fields because of poor conditions elsewhere, resulting in a tighter schedule for your major renovations.

Determine what patterns need adjustment to conform to next season's budget and play schedules. Decide which pattern variations are one-time events and which have a long-term impact that should be and can be corrected.

Once your analysis is complete, not only will you know what worked and what didn't, you'll have the tools to minimize your failures and build on your successes, including a written summary report you've developed for future reference. ❑

As extension turfgrass specialist with the University of Georgia, Dr. Gil Landry provides leadership in the development of statewide educational programs in turfgrass management. He's a past president of the national Sports Turf Managers Association, co-chair of the Public Relations Committee, and recipient of STMA's highest award, the Harry C. Gill Memorial Award: STMA Groundskeeper of the Year.

Lights! Camera! Action!



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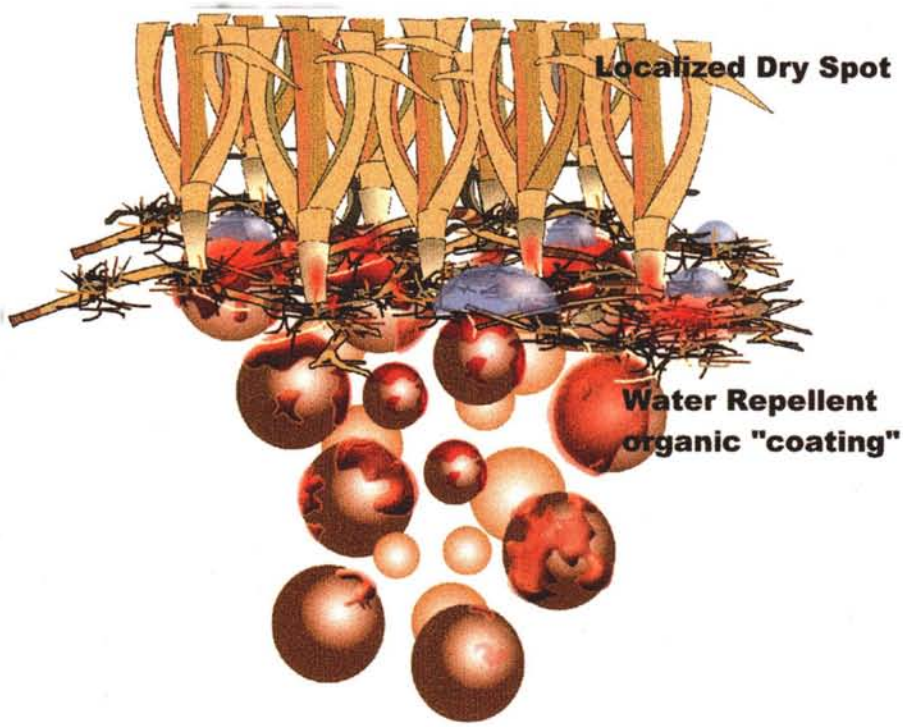
How Wetting Agents Apply

By Dr. Tony Koski

Water is a truly unique compound. Individual water molecules have a strong attraction to each other due to their dipolar nature, while at the same time being strongly attracted to other things in nature, such as clay, silt and organic matter. This attraction allows soil to hold water for plant use. Water, however, is not strongly attracted to individual sand grains, but rather to the small pores between sand grains of appropriate size — hence the USGA greens-mix type of sports field construction.

The strong attraction that water molecules have for each other is especially apparent when water is sprayed on a hydrophobic (water-repellent) surface, such as a newly waxed car or on a plant leaf. In both cases, the waxy surface actually increases the attraction of water to itself (surface tension), causing the water to "bead up" and preventing it from spreading evenly over the surface. Unfortunately for turf professionals, similar hydrophobic conditions can develop in soils and prevent water from moistening soil uniformly. This is the reason hydrophobic soils, thatch and isolated dry spots occur.

In other situations, we encounter stratified layers in rootzones, the result of changes in philosophy regarding topdressing materials and/or frequency. Water has a difficult time moving between adjacent layers of sand, thatch, soil, peat, sand again, thatch again, and so on. You get the picture.



In a typical hydrophobic situation, a waxy or other water-repellent coating forms over soil particles and thatch, increasing the attraction of water to itself. The water bead ups and does not spread evenly. Illustrations courtesy: Colleen M. Tocci, Aquatrols Corporation of America.

The Good, The Bad and The Useless

The time-honored, field-proven method of dealing with these problems is the use of wetting agents. A wetting agent is simply a surfactant (or "surface-active agent"), a material that reduces the attraction of water molecules for each other. This action enables the water to spread out more evenly over hydrophobic surfaces, to move more quickly through small pores and more effectively across "boundaries," such as those layers in turf.

What They Don't Do. As a point of caution, don't consider wetting agents "miracle cures." They:

- do not reduce compaction,
- do not affect plant water-use rates,
- cannot replace basic cultural practices like proper topdressing frequency, core cultivation, thatch control, installation of proper drainage systems and intelligent irrigation management.

Possible Benefits. Some of the proven advantages of wetting-agent use include:

- improved water movement in soil, especially in layered soils;
- rewetting of hydrophobic rootzones, sands or thatch;
- reduced dew and frost formation.

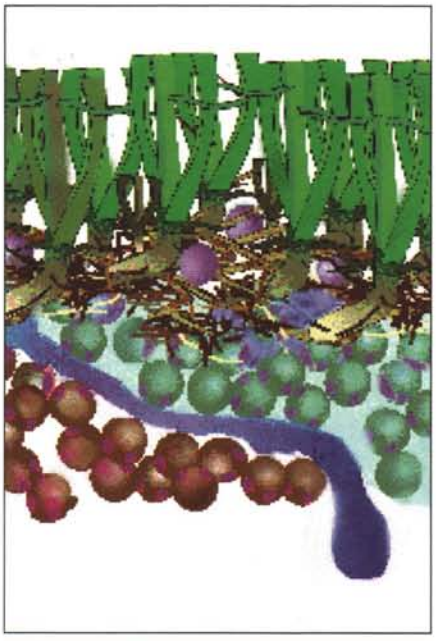
Unproven by research, but often speculated on, is improved movement of pesticides (particularly insecticides) into the thatch layer and underlying soil.

Possible Harm. Potential negative effects (generally seen only with misuse or misapplication) include:

- phytotoxicity when the wetting agent is applied to stressed turf or if it is not properly watered in;
- root injury (rare);
- increased thatch accumulation (the healthier the turf, the more thatch it forms);
- deflocculation (dispersion) of soil particles, which is a potential problem with long-term use of excessive rates.

What Brand Is Best?

This is like asking what is the best beer or the best pickup truck. They all possess the potential to be misapplied,



Changes in philosophy regarding topdressing materials and/or frequency can result in stratified layers that water will flow over rather than penetrate — a condition wetting agents can temporarily modify.

and all can achieve the same results: enhanced water infiltration and drainage, more efficient water use, fewer overly wet or dry spots, and better-quality turf. Those that have large market shares wouldn't sell if they were not effective wetting agents.

Typically, we use the wetting agent with which we have the most experience — the one that we know we can depend on.

Reminders

When trying a new wetting agent, it is best to follow the label until you are comfortable with its activity because the chemistry of wetting agents can differ greatly. Some of the most effective wetting agents can cause quite severe phytotoxicity when misapplied, but that is the fault of the applicator and not the wetting agent. Treat them as you would any other chemical tool, and you will stay out of trouble.

Residual activity will depend on many factors: the brand used, application rates, soil types, amount of thatch, temperature, irrigation regimen and the type of problem you're trying to solve. Also, soil microbes will utilize wetting agents as a food source, and wetting agents can be leached through rootzones, especially on sandy soils.

When isolated dry spots or a layered soil is the problem, core cultivation in conjunction with wetting-agent use is always more effective than wetting agents alone. Regular use of wetting agents in these situations is important because they are not eliminating the condition, only temporarily modifying it. ❑

Anthony J. Koski, Ph.D., is an associate professor with the Department of Horticulture at Colorado State University Cooperative Extension.

STMA IN ACTION

MAFMO's Fall Field Day Goes to School

On Thursday, September 25, the Mid-Atlantic Athletic Field Managers Organization (MAFMO Chapter STMA) took its Fall Field Day to school. Seventy attendees gathered at the football field of Magruder High School in Rockville, Md., at 8 a.m. for the special "Turf-Ace in the Turf" combination educational sessions, demonstration and field-renovation project.

The school site was selected partly because of a special pilot program that Magruder High School's horticulture instructor, Ray Smith, is testing for Montgomery County's high schools. The one-year course, called Landscape and Turfgrass Management, has 20 students enrolled. Each class covers two periods, giving the students double time to really dig into their material.

Dig in they did. The 20 students had moved supplies onto the field in preparation for the field day and helped throughout the day with various aspects of the demonstration program.

In the foreground, instructor Ray Smith (left) and principal John Nori compare notes on student participation during MAFMO's Fall Field Day at Magruder High School. Photos courtesy: Trusty & Associates.

In addition, 99 students from Smith's other horticulture classes joined the sessions, each participating during what would have been their regular horticulture class period that day. Magruder High School's principal, John Nori, also joined part of the day's activities, taking time to meet and thank as many of the attendees as his schedule allowed.

Smith welcomed the group and gave a brief overview of the pilot program and the activities of the day. Throughout the school year, the 20 students in the pilot program gain hands-on learning experience as they maintain the field. They also have the opportunity to see that what they do actually makes a difference in field conditions.

Tim Anderson, sports field specialist for Seedco of Baltimore, then gave a presentation, "The Basics of Sports Turf Management," and Steve Trusty, STMA executive director, spoke about STMA, the services it provides to members and outlined the association's developing Certification Program.

Each of the companies donating to the renovation project gave a short explanation of their products or services and how they would be used in the renovation. Alpine Services contributed the aeration, topdressing and rolling. Aimcor provided three tons of Turface and the services of Tim Anderson. Gaithersburg Ford/Kubota supplied the tractor and slit seeder. Lesco provided the fertilizer. Newsom Seed supplied the overseeding and the services of field-day coordinator Allen Bohrer. Sherwin Williams provided the field-marking paint. Toro/Turf Equipment and Supply Company supplied the topdresser.

Once the presentations were completed, the focus moved to the field. And what better way to demonstrate equipment and supplies than to put them to work in an actual field renovation? The one-day session came at an ideal time because the school's next football game was just 1 1/2 weeks away. Demonstrations on field lining and painting topped off the hands-on sessions.

Following field activities, attendees collected further information from table-top displays set up by the contributing companies. For everyone, the day proved a beneficial example of a chapter-service project teamed with a hands-on educational opportunity.

STMA Chapter News

Florida Chapter #1: Florida Chapter #1 will assist newly forming Florida Chapter #2 in hosting STMA's 9th Annual Conference & Exhibition, "Meeting the Challenges," to be held January 14-18, 1998, at Disney's Coronado Springs Resort and Disney's Wide World of Sports complex in Orlando, Fla.

For information on the STMA Annual Conference and Exhibition, contact STMA Headquarters at (800) 323-3875.

For information on Florida Chapter #1 or other pending activities, contact John Mascaro: (954) 938-7477.

MAFMO: The Mid-Atlantic Athletic Field Managers Organization

Tim Anderson, sports field specialist for Seedco of Baltimore, demonstrates proper techniques for student and pro alike at MAFMO's field day.