

What to do with a hard field

BY DR. BARRY STEWART

Last summer there was very little rain in northeast Mississippi during August and September. Grass stands on non-irrigated turf thinned out, the soil dried out, and athletic fields became very hard, so hard that they would be unsafe to play on. Granted this was an extreme case and when needed rain began to fall these fields quickly softened. Here's what you can do about hardness and unsafe conditions.

Most athletic fields become hard due to traffic. We set off to build firm fields but not hard ones. Traffic is a combination of wear and soil compaction. Wear contributes to increased hardness by removing biomass that provides cushion and impact absorption. Compaction forces more soil particles into a given volume resulting in a denser soil with decreased pore space. As a soil becomes denser its particles have less freedom of movement. The soil becomes more rigid and harder.

A similar thing happens when native soil fields become dry. The particles bind together as the clay minerals are de-watered and the soil becomes more rigid. When the soil is re-wetted water films return to the soil particles and provide lubrication to allow the particle to move over each other more freely.

You have some tools at your disposal that will give a pretty good indication whether a field that is too hard or too soft. I think every field manager should own a pair of cleats and should get out and run around on his field from time to time. If it feels like your cleats are not penetrating the surface then it is likely too hard. Your soil sampling probe and pocketknife can also help you locate hard areas or give an indication of how hard your surface is. If you cannot push the soil probe more than a 1/4 inch into the surface or cannot push your pocketknife into the soil using only your thumb then you have a hard field or at least a hard spot. Move around, get a picture of the whole field, see if there are isolated hard spots or if the whole field is hard.

Mowing height

The presence of a thick healthy cover of a desirable turfgrass species is a large factor in providing a safe playing surface. You should keep in mind the relationship between cutting height and turf density before making a knee jerk reaction and growing the grass taller to keep



the field from getting hard. Research on bermudagrass has shown that raising the cutting height from low cutting heights (1/2 inch) to more moderate heights (3/4 to 1 inch) increased the impact adsorption of the surface. Additional increases in cutting height only slightly increased the impact absorption. As cutting height is raised shoot density declines. This means we have fewer shoots located close to the surface and most likely longer blades of grass. The blades are more prone to wear and once they are worn away there are fewer growing points to grow back from than in a more closely mowed turf, thus the recuperative potential of the turf is decreased.

The biomass of a dense turf is a factor in modifying surface hardness, but turf density also serves to regulate soil water content. On nearly every field I have been on the hardest spots are those in which the turf is thin. When turf gets thin the soil is allowed to bake in the hot summer sun, the clays contract and the soil becomes very hard. The grow habit of a grass can play a role in surface hardness. Grasses with a prostrate or lateral growth habit tend to form a mat of biomass on the soil surface, not only providing cushioning but also retaining soil moisture. A more upright growing variety allows more evaporation from the soil surface resulting in a drier harder soil.

I have research plots that compare MS-Choice bermudagrass, a prostrate grow-

If it feels like your cleats are not penetrating the surface then it is likely too hard.

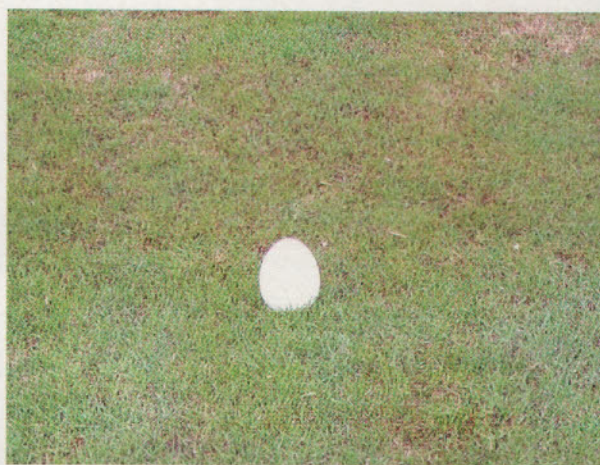
ing variety and common bermudagrass that has a more open canopy. In the heat of a Mississippi August the MS Choice has a surface hardness that would be very playable while the common bermudagrass would be too hard to play on even though both grasses are receiving the same amount of water.

Cultural practices such as core aerifying and topdressing provide some loose material at the surface that has not been compacted and are key operations in maintaining a safe playing surface. Research has shown time and time again that the most effective treatment for maintaining a soft playing surface is core aerification. In addition core aerification creates macro pores, reduces bulk density and improves internal drainage. Core aerification can be used as a cure for hard compacted fields but is better used as a tool to prevent fields from becoming compacted. In addition aerification and topdressing will improve growing conditions and give you a better chance of maintaining a healthy dense turf.

Water management that does not allow field to get too dry, growing a healthy dense turf and core aerification are key elements in dealing with hard fields as well as avoiding their occurrence.

ST

Barry Stewart is an Assistant Professor of Agronomy at Mississippi State University, where he teaches as well as researches athletic field management.



Research has shown time and time again that the most effective treatment for maintaining a soft playing surface is core aerification.



Wear contributes to increased hardness by removing biomass that provides cushion and impact absorption.

Getting technical

As a researcher I measure surface hardness with a Clegg Impact Soil Tester (CIST). It is a simple device, a cylindrical mass is dropped down a guide tube and an accelerometer measures how fast the mass comes to a stop when it impacts a surface. The accelerometer sends an electronic signal to a recorder that displays the result in units of Gmax that is measured in gravities (g). Surfaces with high Gmax value are hard surfaces while low Gmax values indicate a softer surface.

For example a concrete sidewalk has a Gmax of 1400-1500 while a high quality athletic field may have a Gmax of 80. CISTs are commercially available for about \$2,000. Using them to determine the impact attenuation of a football field is outlined in ASTM Standard F 1702. Unfortunately, this standard does not contain a Gmax value that is characteristic of a field that is too soft or too hard for play.

Following the method in this standard my personal experi-

ence suggests that a Gmax number between 75 and 95 is preferred and Gmax values from 30 to 130 are acceptable for American football. A number you will see in some literature is 200 but that number comes from ASTM Standard F 1936. That standard uses a device similar in configuration to a CIST but with a much heavier mass (10 kg) of differing dimensions. The device used in ASTM F 1936 is not commercially available but some researchers and artificial turf companies have had them custom built for about \$15,000. Due to differing masses and methodology the two methods should not be compared and the standard of 200 Gmax (ASTM 1936) is not applicable to CIST. A Gmax of 200 using a 2.25 kg CIST and the method in ASTM 1702 indicates a very hard field.

There may come a day when these types of measurements are commonplace on athletic fields but today these devices are largely research tools.—Barry Stewart



TURF BLANKETS

Acting as a blanket over turf, Typar turf blankets help retain moisture and warmth to encourage early germination and green-up and to help protect turf from winterkill. Turf on playing fields recovers faster than it normally would and is ready for use earlier in the season, which results in safer conditions, more use and happier customers. Typar Turf Blankets have a five-year limited warranty against manufacturing defects and UV degradation.

Typar Turf Blankets/800-289-2448

For information, circle 161



FERTILIZER BLEND

Magic Carpet fertilizer blend from ProSource One is a premium fertilizer designed for superior quality turf that contains 30% of the nitrogen from sulfur-coated urea, plus phosphorus and potash for three-way feeding. Adjust rates based on soil test results and your specific program for best results.

ProSource One/877-350-3999

For information, circle 159



**Compaction is a Leading Cause of Injuries
on the Sports fields**

AerWay®

- No Clean-up of Messy Cores
- No Disruption of Play
- Up to 7" of Deep Tine
Compaction Relief
- Starting at under
\$3,000.00



AerWay® offers low cost, low
maintenance, long lasting options

for more information call **1-800-457-8310**

Advanced Aeration Systems

www.aerway.com aerway@thehollandgroupinc.com

Circle 116 on card or www.OneRS.net/301sp-116

RED INFIELD CONDITIONER

Diamond Pro Red Infield Conditioner is a high quality, durable material applied to the skinned areas of athletic fields to enrich color, improve drainage, reduce rain delays and compaction, improve safety, and create a professional playing surface. The product is available in 50-lb. bags, or for significant savings it can be purchased in bulk truckloads. Red Infield Conditioner and other groundskeeping products are available from Diamond Pro distributors across the U.S.

Diamond Pro/800-228-2987

For information, circle 160 or
see www.OneRS.net/301sp-160

DIFFUSED AIR SYSTEM

The Airtronics diffused air system by Watertronics is ideal for seasonal sub-surface aeration as well as preventing winter ice freeze-overs. The 115v, 3/4-hp vane-type compressor will service up to four pods and provide enhanced aerobic digestion in up to a 2-acre pond at 12-20 ft. submerged. Can be installed in about 3 hours.

Watertronics/800-356-6686

For information, circle 158

NEW WETTING AGENTS

FloraSPORT is introducing to the sports turf industry two new wetting agent products designed for clay and sandy soils. The benefits of the new products mirror the different nature of these two soil types.

MOVE's proprietary formulation promotes quicker, longer lasting moisture penetration properties to soil than traditional wetting agents, says the manufacturer. H2OLD is a non-ionic wetting agent that promotes entry and even distribution of water into the rootzone. Its components then interact with the soil molecules to retard leaching.

FloraSPORT Turf
Products/901-853-2898
For information, circle 165

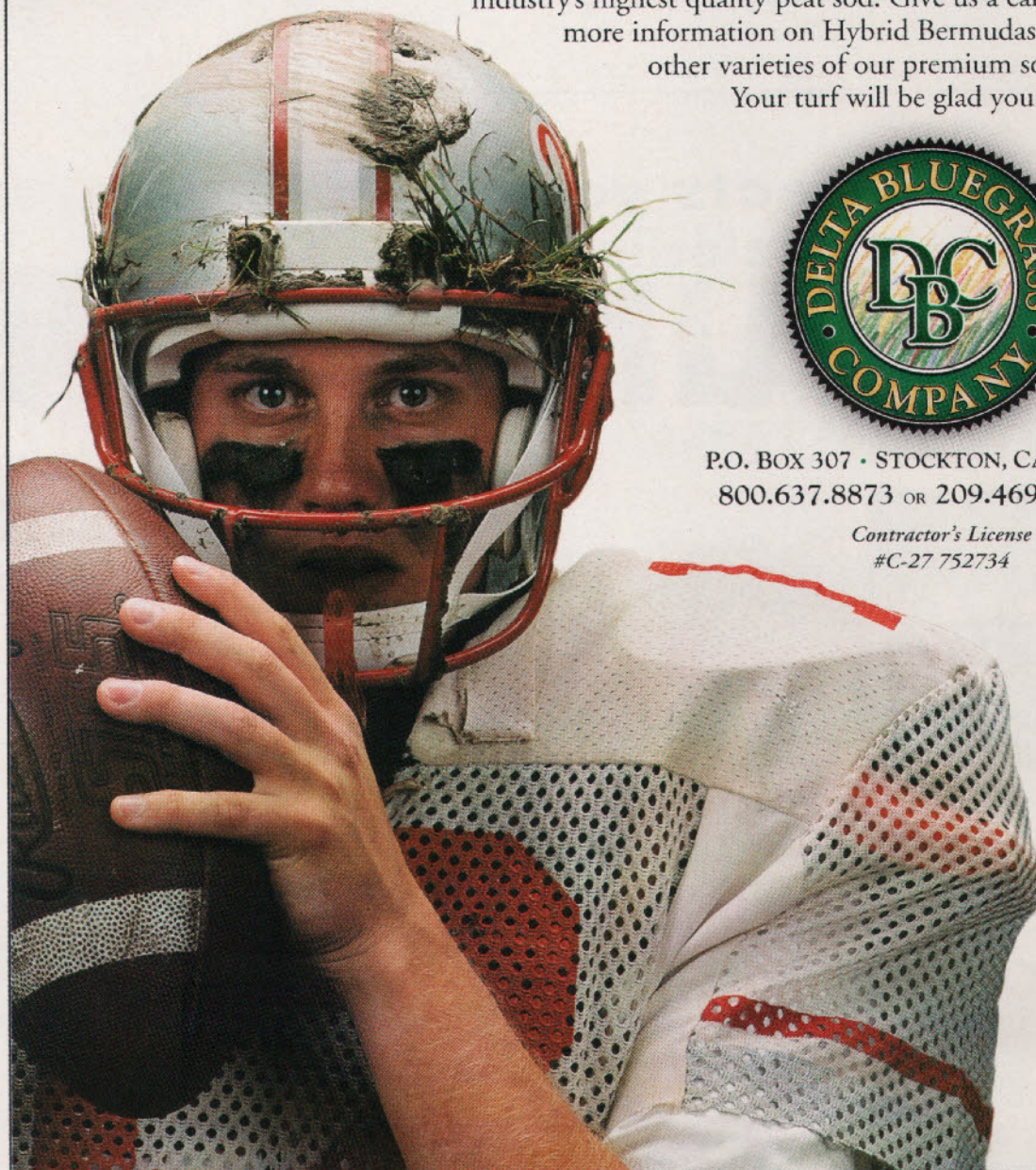
D E L T A B L U E G R A S S

TORN UP

...About The Shape of Your Turf?

Delta Bluegrass Company has the solution - Tifway 419 and our patented, exclusively grown Baby Bermuda. These Hybrid Bermudas are perfectly suited for the strenuous conditions your stadium turf is accustomed to enduring. Washed for your convenience, these warm season grasses are available on sand, meeting USGA specifications, as well as peat soil.

For over a decade, Delta Bluegrass has been producing and installing the industry's highest quality peat sod. Give us a call for more information on Hybrid Bermudas and other varieties of our premium sods - Your turf will be glad you did!



P.O. BOX 307 • STOCKTON, CA 95201
800.637.8873 OR 209.469.7979

Contractor's License
#C-27 752734

Circle 199 on card or www.OneRS.net/301sp-199



NON-GRASS PLAYING SURFACES

Designed to be played on in rain or dry conditions,

Beam Clay Green-Premium infield mix doesn't get muddy when wet yet retains moisture and resilience in dry weather, says the manufacturer. An alternate surface to grass for soccer fields and multi-use fields where the skinned areas are used for soccer or football.

Partac/Beam Clay/800-247-2326

For information, circle 167

PROTECT YOUR TURF

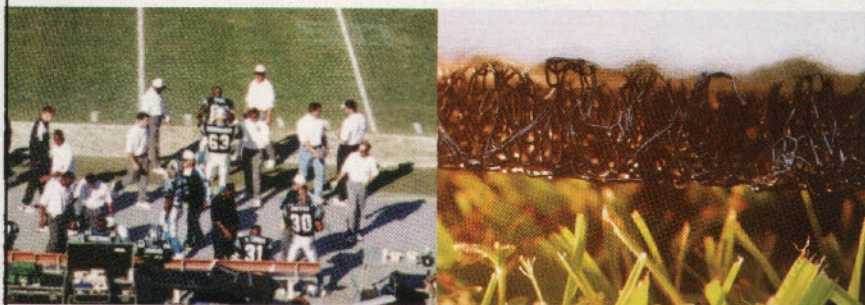
Maintaining the turfgrass on an athletic playing field or golf course requires a major investment of time, money and labor, but Turf Defender turf blankets can help protect your investment. Made of durable woven polypropylene fibers, Turf Defender turf blankets help make those Saturday games happen by promoting turfgrass germination and growth and helping to protect turf from winterkill, so that turf recovers more quickly. They have UV stabilizers for sunlight resistance, and they're made with a 2-inch hem for extra strength.

Parkside Earthfabrics/

800-289-2448

For information, circle 162

Nothing protects your
sideline
better than
EnkamatPlus®
Turf
season after season



Call our distributor Covermaster for product information and pricing.

COLBOND

info@colbond-usa.com
1-800-365-7391
www.colbond-usa.com

COVERMASTER
COVERMASTER
COVERMASTER

info@covermaster.com
1-800-387-5808
www.covermaster.com



LINK PUMP SYSTEM & CONTROLS

Watertronics closes the loop between the irrigation pumping system and the irrigation central controls with the PumpLink software interface. Used in conjunction with Watervision operating software, PumpLink connects the pump station and the irrigation program so they communicate in real time, which allows the irrigation system to get water to where it is needed reliably. The PumpLink interface comes standard with Watervision (which will run on any brand of irrigation pumping system), and is fully compatible with all the major irrigation manufacturer's operating software programs.

Watertronics/800-356-6686

For information, circle 086, or
see www.OneRS.net/301sp-086



STAY GREEN

Put EVERGREEN turf blankets to work on a natural grass football, soccer or baseball field and you'll solve many a turf maintenance problem. This turf growth blanket by Covermaster "greens up" grass quicker in the spring and keeps it green longer in the fall. It's also ideal for quick seed germination during construction or repairs of heavy wear areas and truly promotes and accelerates deep root growth. You create a 'greenhouse' type of effect that allows grass to breathe while retaining the right amount of heat and moisture for rapid growth of natural turf.

Covermaster/800-387-5808
For information, circle 163 or
see www.OneRS.net/301sp-163

COMPACTION PROBLEM?

deep, clean slicing
for athletic fields
and fairways

7in or 9in depth

63in working width for
fast coverage

optional floating roller
for smooth
finish

range of slicing
blades available

NO PROBLEM!

with the
SISIS MAXISLIT DEEP SLICER

For full details of the SISIS deep slicer and your local dealer, please contact:

SISIS Inc., PO Box 537, Sandy Springs, SC29677

tel: 864 843 5972 fax: 864 843 5974 email: ido@sisis.u-net.com

VISIT THE SISIS WEBSITE
www.sisis.com

SISIS - DESIGNERS & MANUFACTURERS OF TURF MACHINERY SINCE 1932

Circle 120 on card or www.OneRS.net/301sp-120

STABILIZE TURF

TurfGrids is a polypropylene fiber that is used to stabilize turf and high vehicle traffic areas such as turf parking or roadways. TurfGrids act like a mass of indestructible roots to increase load bearing in the rootzone. The manufacturer says product does not interfere with standard maintenance operations.

Stabilizer Solutions/800-336-2468

For information, circle 166



SYNTHETIC GRASS LINING SYSTEM

For use with natural turf fields, Permaline synthetic grass lining system can offer a cost-effective solution to field marking and slash your budget, says the manufacturer. Other benefits include: 10-15 year life; 5-yr. guarantee against UV fading and premature wear; can be installed in almost any environment where natural turf grows.

**Permaline Sports/
866-546-3787
For information, circle 168**



ONE-PIECE STENCILS

Economical one-piece stencils designed by the folks who do most of the NFL logos can be custom cut by Partac/Beam Clay. They use 6 mil ploy sheets up to 160 ft. long with color-coded half-moon cutouts that you spray paint or mark with chalk, then connect and fill in with spray paint after removing the stencil.

**Partac/Beam Clay/800-247-2326
For information, circle 094**

PROFESSIONAL GROUNDSKEEPING PRODUCTS

Infield Conditioner
Calcined Clay
(Professional, Top Dressing, Drying Agent)
Athletic Field Marking Dust
Mound & Home Plate Clay & Bricks

**STMA
San Antonio
Booth #441**



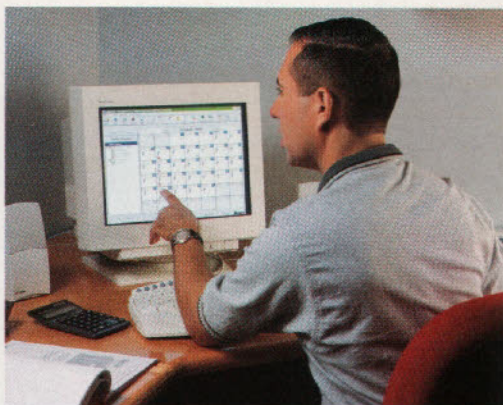
**DIAMOND
PRO**

800 228 2987
www.diamondpro.com

WHEN EVERY GAME COUNTS



Circle 121 on card or www.OneRS.net/301sp-121



MODULAR CENTRAL CONTROL

Hunter Industries has introduced the IMMS, a modular central control system that has made large-site irrigation management and monitoring more affordable for commercial and institutional facilities, says the company. Up to 100 different locations can be networked from a single centralized IMMS computer. Each location can handle up to 100 controllers networked into the IMMS site interface.

The system's modularity means you can network a limited number of controllers initially, then add to the system as your budget permits.

Hunter Industries/800-733-2823

For information, circle 088 or see www.OneRS.net/301sp-088

3-IN-1 SPRAYER

Looking for a grounds maintenance cost effective tool for sports field marking, parking lot stripping, and weed control? Tru Mark Athletic Field Marker has an innovative solution called the E-100 Athletic Field Marker that can perform all three functions.

The ergonomic designed three wheel platform along with 12-volt industrial strength pump makes a cost effective three-in-one spraying tool.



"Painting our fields takes a lot less time with our Tru Mark field marker. Clean up is easy and quick compared to other machines I've used," says Rob Carson of Birmingham Public Schools, Birmingham, MI.

Tru Mark/800-553-6275

For information, circle 085, or see www.OneRS.net/301sp-085

Soil Reliever Model 75 Heavy Duty



For deep tine aerification in the toughest conditions, you can't beat the performance of our new SR75 HD.

This machine is built specifically for deep aeration in heavily compacted soils.

If your sports fields are suffering from problems associated with compaction and poor drainage, call Southern Green about our complete line of deep tine aerators.



Breathin' a Whole Lot Easier!®

Proven performance, high productivity, superior design and construction, is what you can expect from the Soil Reliever by Southern Green.

800-888-9893

SPRINKLE, SPRINKLE

The EZ Adjust Series sprinklers from Toro are available in high-pop, lawn pop-up, and shrub models. All arc, flow, trajectory, and radius adjustments can be made from the top of the sprinklers, which are clearly marked with laser-etched indicators.

The top arc adjustment permits settings from 30-360 degrees and an easily seen red band on the riser allows quick verification of the setting. A left-arc indicator is visible on body and cap. The sprinklers have X-Flow feature that shuts off water flow while the system is running. Water pressure maintained in the sprinkler body holds up the riser, leaving your hands free to make arc or nozzle changes without getting wet.

The units are vandal resistant; a Smart Arc feature returns the sprinkler to its preset arc in case of tampering, and a slip clutch prevents gear damage by vandals.

The Toro Company/
800-664-4740

For information, circle 164 or see www.OneRS.net/301sp-164





FOR IMMEDIATE RELEASE LINE MARKER

The Fastliner line marking system by Broyhill is the ideal tool for athletic fields, streets, and parking lots. The unit mounts onto most popular turf utility vehicles and performs at speeds up to 15 mph. The 14-gal. poly tank ensures consistent paint application via a 12-volt diaphragm pump. The exclusive non-clogging paint concentrate feeds through an anti-drip nozzle surrounded by a patented spring-loaded marking shoe-designed to apply clean, sharp lines from 1-4 in. wide.

Broyhill/800-228-1003 ext. 34

For information, circle 084, or
see www.OneRS.net/301sp-084

Safety and Performance from the ground up



ALWAYS READ AND
FOLLOW LABEL
DIRECTIONS

Safety for players is your number one concern. Instead of ending up with turf that looks like it's been ground up and spit out, build lush springy turf from the ground up with LAUNCH® Biostimulant.

LAUNCH® combines the best of Gordon's FOCUS® and BOV-A-MURA® into one powerful formulation that encourages strong healthy roots, increased density and wear resistance. When used regularly, it also encourages quick germination, vigorous establishment and the rapid recovery of damaged sports turf, from soccer and football fields to golf greens and fairways.

- Latest surfactant technology for maximum soil penetration
- Ideal for seeding, sodding, sprigging and hydroseeding
- Contains humic, fulvic acid extract and kelp extract
- Enhanced with deodorized dairy manure slurry base
- Root and foliar uptake

**pbi / Gordon
CORPORATION**

An Employee-Owned Company

Launch, Focus and Bov-A-Mura are registered trademarks of PBI/Gordon Corporation.
Information regarding biostimulants can be viewed on our web site.

1-800-821-7925 • www.pbigordon.com

Circle 123 on card or www.OneRS.net/301sp-123