

Maintenance Program – Glynn County Stadium

Aeration

- End of May - First of June: Deep tine or verti-drain aeration to 6- to 8-inch depth, two directions, followed by topdressing with 110 to 120 tons of sand
- Laser leveling of sand
- Spike aerate to 3-to 4-inch depth with arrowhead spike every three weeks from late June to August 30

Fertilization

(Applications based on results of soil tests taken in September and April)

- Early June, once grass cover appears after topdressing: 5-10-15 for root growth
- Late June and late July: 18-3-6
- July: Roots
- August: 100 pounds of 34-0-0 over playing surface at five- to seven-day intervals beginning two weeks prior to first football game
- Additional micronutrients according to soil test results
- Lime as needed to maintain pH range of 6.4 to 6.6

Topdressing and Soil Amendments

- Light topdressing following every other football game from start of football season to Nov. 1
- Two to three tons of calcined clay applied between hash marks every other year

Overseeding

- Overseed with 70 percent annual ryegrass, 30 percent perennial ryegrass at the end of October during the two-week window of away games.

- Overseed again in early January.
- Transition back to bermudagrass slotted for mid- to late-April, prior to spring football. Control products used if necessary to supplement cultural practices of lowered mowing height and higher fertilization rate.

Mowing

- Three-gang reel mower at 3/4-inch height from start of growing season to August 1
- Triplex reel ride on mower beginning August 1: 3/4-inch height until after fourth football game, then gradually raise height to 1-inch
- Mowing scheduled three times per week: Monday, Wednesday and Friday; frequency increases if turf growth warrants it

Pest Control

- Pre-emergence weed applications made second week in November and at end of March
- Post-emergence weed control follows standard IPM practices with control products applied only as necessary
- IPM program followed for insect and disease control
- Dollar spot and Fairy ring (due to the decaying organic matter in the field) most frequent problems
- Mole crickets major insect problem
- Activity of other disease organisms or insect pests, such as army worms, varies with weather conditions (Skeens call this factor "the pest of the season.")

For Quality Turf

DEBRIS BLOWER

NEW MID VAC

COMPACT SELF-POWERED VAC SYSTEM

- Rotating Rubber Finger Pick-Up
- 20 hp. Honda Engine
- Easy Towing

5' WIDTH AND SHORT WHEEL BASE
ALLOW FOR TIGHT TURNS IN SMALL AREAS

Goossen INDUSTRIES
P.O. Box 705 | Beatrice, NE 68310
TOLL FREE: 800-228-6542
IN NEBRASKA: 402-228-4326
FAX: 402-223-2245
WEBSITE: www.goossen.com

Call 1 (800) 817-1889 use **Fast Fax #1050200** and/or Circle **105** on Inquiry Card

A Dedicated Professional

Skeens is a master at planning, not only to get everything accomplished, but also, as he puts it, "To get a pretty good product for a pretty reasonable budget." He brings a strong background to the task, having obtained a B.S. degree from the University of Florida with a minor in Forestry and several courses in Public Administration, before earning his Masters degree in Parks and Recreation from Indiana University. Add to that the strong work ethic and love of the land he gained from growing up on his family's farm to understand why he checks the field seven days a week year-round. Besides that, he's been taking care of the field for 10 of its 13 years, the first six years as the recreation director of landscape responsibilities, and from 1995 to the present in his current position.

Skeens is dedicated to achieving the best possible results, making sure the field is monitored when he can't be there. He is also dedicated to developing his own professionalism, visiting other fields and connecting with other

field managers to share ideas. He's always seeking not just the solution to a problem, but the best solution.

Skeens has developed a win-win informal networking arrangement with a local four-golf course resort complex. He'll consider a purchase option when they're ready to trade up on equipment, which gives him good used equipment at a reasonable price and gives the course more flexibility on their upgrades.

He has also tapped into a money-saving method of using the stadium's irrigation system. The irrigation water source is an enclosed, 8-inch deep well, located just inside the field house, with a 1,000 gallon tank. An above-ground, 25 hp centrifugal pump pulls 280 gallons per minute from the well. Skeens uses four Nelson "guns" to irrigate the field, putting down a lot of water in a short period. Only one of the guns can be used at a time since one takes the full capacity of the pump. A row of pop up rotor heads running down the center of the field is the only underground portion of the irrigation system. The pump and

well combination also supply water to the restrooms during the games. City water is used only for the concession stand and the locker rooms.

"The field bond issue was highly criticized during the first few years following construction, but as our program has evolved and the field has become a high-quality resource used by a broad spectrum of the community, it's become a source of pride," Skeens says. "Coaches love to play here, and earning the Field of the Year Award has brought us even more recognition and compliments. With all that, I think the greatest satisfaction comes from seeing the appreciation on the faces of our student athletes each time they walk on the field."

Bob Tracinski is the Business Communications Manager for the John Deere Worldwide Commercial & Consumer Equipment Division headquartered in Raleigh, NC. He serves as public relations co-chair for the national Sports Turf Managers Association.



Infield raincovers can now be installed in a minimum of time.



Even a full size fieldcover for football or soccer is easier to handle.

Field Protection Made Easy...

with the **FIELDCOVER SYSTEM** by **COVERMASTER®**

You're always ahead of the game with the Fieldcover System by COVERMASTER®.

Thanks to this easy-to-use equipment, installation, removal and storage of a fieldcover can be quick and simple.

First, there's **TARPMATE™**, a strong and lightweight plastic roller available in any length and

supplied with safety end caps.

Then comes **TARP MACHINE™**. Attached to the P.T.O. on your tractor, this clever handling tool makes light of rolling the cover on and off the field.

Finally, with our wide choice of cover materials, COVERMASTER® will custom design a cover in the size, weight and configuration that meet your specific needs.

The COVERMASTER® **FIELDCOVER SYSTEM**. You could say we have you covered.

Call us today and see.



SEE THE ACTION ON VIDEO!



COVERMASTER™
COVERMASTER
COVERMASTER

MASTERS IN THE ART OF SPORTS SURFACE COVERS



CALL TOLL FREE 1-800-387-5808

MEMBER
Sports
Turf
Managers Association

www.covermaster.com
E-mail: info@covermaster.com

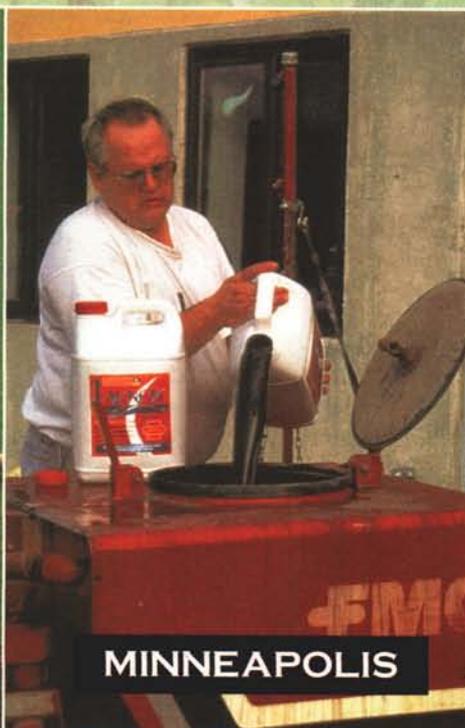
COVERMASTER INC., 100 WESTMORE DR. 11-D, REXDALE, ON, M9V 5C3 TEL 416-745-1811 FAX 416-74-COVER (742-6837)

Circle 104 on Inquiry Card

They're putting down roots all over...



NASHVILLE



MINNEAPOLIS



KANSAS CITY

"Seven weeks after it was laid, our TifSport bermudagrass had put down roots 10 to 12 inches deep thanks to Launch® applied every four weeks. When the NFL inspected our field they couldn't believe a rain game was played only a day before! We're using Focus® this fall to maintain our turf condition."

Terry Porch
Tennessee Titans

"I put Launch® up against another biostimulant I was using and the first thing I noticed was an extra two inches of root growth. Recently, the team held a grueling two-hour practice with the offense really pounding a concentrated area. Afterwards, I checked the turf and couldn't even see where they practiced."

Dale Wysocki
Minnesota Vikings

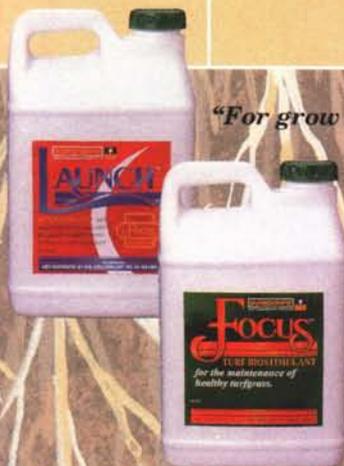
"Due to stadium construction, portions of our field were sodded only a week before the opening game. I applied Launch® and the sod was knit down and playable. The massive root development I get with Launch enables me to maintain my entire bluegrass field at 1.25 inches mowing height. I haven't had to use a lot of fungicide, and it really gets hot down here in the stadium."

Trevor Vance
Kansas City Royals

Conditioning. The coach makes sure the players get it. It makes 'em tough. So when they're being pounded in the game, they don't buckle under all that physical stress.

Your turf gets pounded, too. But you can keep it in top playing condition with Gordon's new Launch and Focus Turf Biostimulants. They help your turf put down the roots that keeps it ready for the game.

Condition your turf with Launch and Focus Turf Biostimulants. For tough turf that won't buckle under. Even after the game.



"For grow in, sod, sprigs, seeds."

"For top conditioning of high spec turf."

PBI/GORDON CORPORATION
An American Turf Company

1-800-821-7925
www.pbigordon.com

ASTM Standards for Skinned Areas

by Steve and Suz Trusty

Turf may be the first impression of a baseball or softball field, especially when striking patterns are etched in that sea of green. But when it comes to playing the game, the overwhelming majority of the action takes place on that turfless patch of "dirt," the skinned area encompassing the basepath, bases, home plate and the skinned area at the center of the jewel where the pitcher reigns.

In baseball and softball, as in all field sports, ideal conditions take the field factor "out of play," allowing each player, regardless of age, gender or experience level, to play the game to the best of their own abilities. Ideal conditions for the skinned area surfaces along the basepath combine a lower layer of hardness with a cleat-depth coating layer of soft material to provide the traction necessary for a player to round the bases at full speed and the cushioning that protects the player in a slide to beat the ball to the base. Ideal conditions offer smooth transitions between the skinned area and surrounding turf with no ridge or lip to alter the path of the ball and thus influence the outcome of the game. Ideal conditions strike the right balance between wet and dry moisture levels, providing a playing surface that is neither sticky nor powdery.

The Big Picture

The American Society for Testing and Materials (ASTM) has multiple subcommittees examining various aspects of achieving higher levels of safety in sports. Dr. Don Waddington serves as Chair of the Natural Playing Surface Sub-committee, which is within the Sports

Equipment and Facilities Committee of the ASTM. Dr. Waddington is Professor Emeritus of Soil Science at Penn State University after retiring from his role teaching and conducting research in the University turfgrass program.

Dr. Waddington notes, "Subcommittees are working on standards

American football fields. Another group is studying the relative abrasiveness of synthetic turf surfaces. There's a task group under the subcommittee on footwear looking at a method of measuring traction. There's a group looking at eye protection. The whole aim is to have more safety in sports."



Bird's-eye view of Coors Field, Denver, Colo., home field of the Colorado Rockies.

Courtesy: Trusty & Associates

and guidelines for everything from bikes and in-line skates to gymnastics and camping. A subcommittee working on tennis courts and track surfaces has developed guidelines for grass tennis courts. There's a group looking at specifications for pole vault landing pits and a group under playground surfaces looking at new standards for specification of engineered wood fiber for playground surfaces. One group is studying the shock absorbing properties of North

Defining Ideal

A major problem in establishing recommendations for the construction and maintenance of skinned area soils is the broad range of fields. Baseball and softball diamonds vary from the true sandlot level, where the basepath is exposed native soil established by the players wearing away the turf as they run the bases, to the premium fields of Major League Baseball.

Dr. Waddington says, "It's a long

Not since Doogie Howser has a 13-year old done so much in so little time.





The Turf System Mowers

In 1993, they raised the bar for lightweight fairway mowers and they continue to lead the pack.



John Deere TurfCare

Built in 1997, this \$35 million dollar facility is responsible for all aspects of golf and turf development, from the drawing board to production.

2653A Utility Mower

The stability you need, the cut you desire. It set the standard for the trim mower market and continues to deliver exceptional performance.



John Deere

GO TU

John Deere Team Championship

The only sanctioned tournament where the course superintendent, pro, and manager play as a team. The way it should be.



Imagine what we'll do

How time flies: In 1986, John Deere decided to enter the golf and turf business. It's an understatement to say we weren't an overnight success. But by learning from our mistakes and, most importantly, listening to what superintendents wanted and needed, we started coming out with machines that were right for the course. Machines like the 2653A

JDC™ Golf & Turf Leasing

Our financing has made it possible for courses to acquire current equipment at a lower cost and with reduced annual maintenance and repair. Not a bad deal.





Official Equipment Supplier to the PGA Tour

On every PGA TOUR owned and operated property, John Deere equipment maintains each and every blade of grass.



Feedback

Now in its eighth year, Feedback has brought over 3,000 superintendents to our headquarters to evaluate and critique current and future equipment.



JD ProConditioned™

Reconditioned equipment that's so good you have our word on it. Every JD ProConditioned piece of equipment comes with a one-year warranty.

LF & RE



with the next century.

Utility Mower. The Turf System Mowers. The Aercore Aerators. And the 2500 Tri-Plex Greens Mower. Thanks to products like these, John Deere will soon become the leader in golf course equipment sales. We owe a great deal of that success to you, the superintendent. And as we continue to grow, we'll continue to listen. You can bet on that.

Gator® Utility Vehicles

Three of the hardest workers you'll find on a golf course: the Turf Gator, the E-Gator, and the new heavy-duty ProGator.



John Deere Parts

There's no substitute for genuine John Deere parts. Parts that are honed to perfection and made to outlast will-fitters.



Aercore Aerators

The competition is trying to duplicate it, but you can't beat the original. With its unique "Flexi-Link" design, the Aercores take aeration to a new level of quality and consistency.



Your John Deere Distributor

Nobody but nobody outserves a John Deere distributor. From the best machines to quality parts and financing, our distributors do it all. For the one nearest you, dial 1-800-537-8233.

Nothing Runs Like A Deere®

John Deere line of Golf and Turf products.



1200A Bunker
and Field Rake



2500 Tri-Plex
Greens Mowers



2653 and 2653A
Professional
Utility Mowers



RZI 700
Root Zone Injection



3215A and 3235A Turf
System Lightweight
Fairway Mowers



180A and 220A Walk-
Behind Greens Mowers



TC125 Turf
Collection System



E-Gator Electric and
Turf Gator® Utility Vehicles



ProGator®
Heavy-duty
Utility Vehicle



800, 1000, and
1500 Aercore Aerators



process to identify all the issues involved. With organized play, skinned area soils are part of native soil fields, augmented native soil fields and various construction formats of sand-based fields, all with differing levels of funding for construction and post-construction field maintenance. Even with the same basic construction and equal budgets there are differences among teams and groundskeepers on what constitutes the 'right' degree of hardness and softness for the ideal skinned area.

"For construction, you could have something quite sandy that would have high moisture needs to maintain ideal playability or you could have something with a high clay content that would be quite stable, but might be too hard when dry. You need to know what kind of post-construction maintenance the field will receive in order to construct the right field for those maintenance conditions. The amount of play the field must support and the age and skill levels of the athletes are further considerations.

"I'd hate to see the day when there was only one way to construct and maintain a softball or baseball field. I don't think every Major League infield should be the same. They should all be reasonable and playable, but I think having the home field advantage brings another dimension to the game."

Guidelines, Not Practices

The need to set workable parameters among all these variables is the reason the ASTM Subcommittee on Natural Playing Surfaces is working on standard guidelines for skinned area soils. Waddington says, "It's important to note that, in this instance, we're working on guidelines, not practices. An ASTM practice gives a definitive procedure for performing one or more operations. Guidelines give a series of options or instructions that do not recommend a specific course of action. With either guidelines or practices, people have the choice to follow them or not to follow them. ASTM doesn't legislate."

The guidelines for skinned area soils under development by the subcommittee should give a range of construction options for the three different types of fields: native soil, sand and modified soil. Within the range of options would be construction for-

mats relying heavily on internal drainage and those relying primarily on surface drainage. Also, within those separate ranges, there should be room to accommodate the differences in tools, soil amendments, equipment, personnel and overall funds for maintenance at varying levels of field use. The goal is a set of practical guidelines that can be

applied to real world situations under real world practices.

Guideline Status

According to Waddington, the ASTM Subcommittee on Natural Playing Surfaces has nearly finalized the draft proposal that was used to solicit comments and help. A task force composed of ASTM subcommit-



Now you can afford to improve your sports turf

Give your grounds crews the right tools for basic sports turf maintenance without spending a fortune. Millcreek turf equipment works great and is priced for schools and park and rec dept's with limited budgets.



Millcreek Front-Mount, 3-Point Hitch and Tow-Behind aerators work with equipment you already have.



Schools and municipalities use our Topdresser to improve sports fields with limited labor.

Aerate turf often

Millcreek core plug aerators give turf roots the air and water they need, especially in high traffic areas such as soccer goals. Players and coaches will be delighted with the results. The exclusive Protector Shield™ safety cage encloses tines during operation and storage. Millcreek aerators work with equipment you already have. Choose from more than 12 professional aerator models, starting around \$1100.*

Topdress to improve soil

The Millcreek Topdresser is more versatile and about 1/3 the price of large area topdressers. Topdressing in conjunction with aeration improves drainage and reduces thatch. The Millcreek Topdresser will help you create a more level playing surface, and is ideal for applying compost as well as sand/peat mixtures. It topdresses a football field in 2 to 3 hours. A single operator can apply infield mix. Starting under \$6000,* you can't beat the versatility and economy.

Rugged, affordable turf equipment

Have a turf professional set up your maintenance program. Then, with Millcreek equipment, your crews can do the job themselves. It's the easiest, most cost-effective way to improve your sports turf.

Call today for complete details.

*Plus freight and set up.

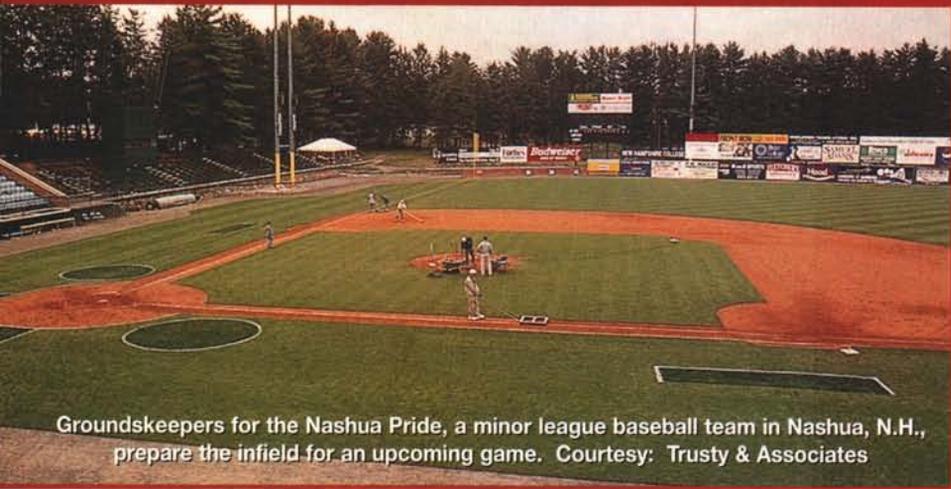


Bird-in-Hand, PA 17505

1-800-311-1323

www.millcreekmfg.com

Circle 151 on Inquiry Card



Groundskeepers for the Nashua Pride, a minor league baseball team in Nashua, N.H., prepare the infield for an upcoming game. Courtesy: Trusty & Associates

tee members sought input from others who are involved in the sports field industry, but are not ASTM members. Dr. Waddington also sent the draft proposal to many university personnel for their input.

Dr. Waddington notes, "We've asked these individuals to make comments, express their objections, if any, and provide information to support any objections. Keeping to the spirit of ASTM, if you don't like something

you suggest something that is better.

"Something that goes to a vote of the subcommittee and receives no negative votes then goes to the full committee for a vote. (The full committee and the ASTM Society votes are taken on the same ballot.) All this must follow the ASTM established timetables."

The ASTM Committee on Sports Equipment and Facilities officially meets twice a year, in May and

November. Much is accomplished in the intervals between the official meetings as the committee members incorporate decisions and suggestions into their specific projects. Proposals developed pass through a range of voting, from task force, to subcommittee, to committee and the total membership of the Society. Changes may be incorporated at each step of this process.

The guidelines will be submitted to the subcommittee for vote at the next cycle and the votes, comments and any objections will be received in the summer of 2000. Should this round of votes achieve the anticipated positive response, the guidelines could go to the main committee and Society levels for vote after the November, 2000, meeting.

Steve and Suz Trusty are partners in Trusty & Associates of Council Bluffs, Iowa. Steve is Executive Director of the Sports Turf Managers Association.



Smooth shearing with National Reel



Jagged whacking with rotary blade



Attractive striping shows-off playing field.

Put The Looks Where It Counts Most

It may be cheap. It may be ugly. But the National 68" Sports Turf Mower is a tough performer. It's ugly because it's built tough, and lasts a long time - we're talking ten, sometimes twenty years. It's so inexpensive you can easily afford to dedicate it just to your athletic fields. Its great flat-top clip on your turf turns into fantastic striping for your field. Pick-up the phone and request a free demo.

Visit us online: www.nationalmower.com
or call: 1-888-907-3463

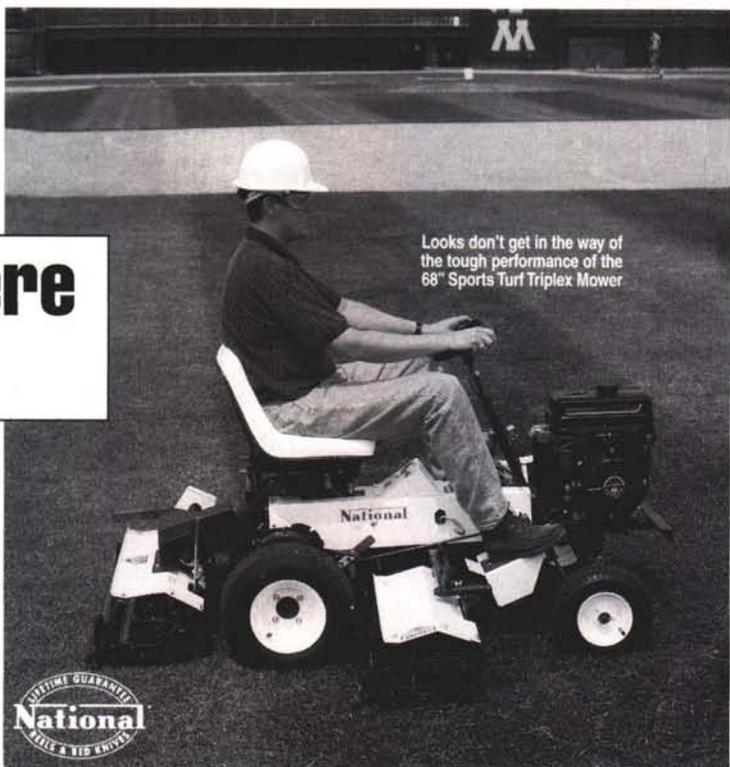


NATIONAL MOWER COMPANY

SINCE 1919

700 Raymond Avenue • St. Paul, MN 55114

Fax (651) 646-2887 Email sales@nationalmower.com



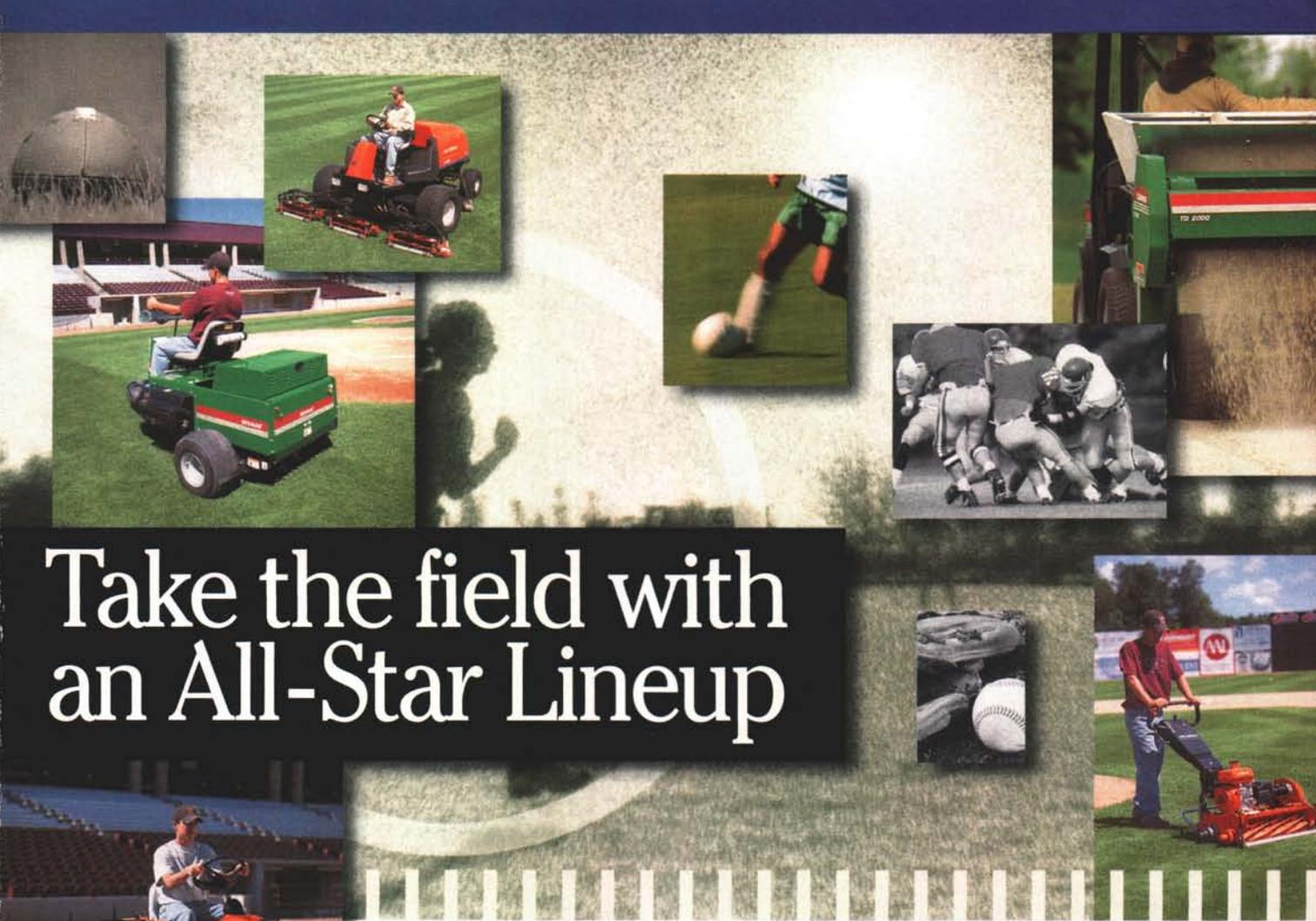
Locks don't get in the way of the tough performance of the 68" Sports Turf Triplex Mower



NATIONAL® is a Registered Trademark of National Mower Company

Nothing makes sports turf look better than a National. The Best Price. The Best Cutting.

Call 1 (800) 817-1889 use **Fast Fax #1100200** and/or Circle **110** on Inquiry Card



Take the field with an All-Star Lineup

The number-one brands in the business are now the top team in turf. Individually, Bob-Cat®, Bunton®, Cushman®, Jacobsen®, Ransomes® and Ryan® have been all-star performers for years. Together, Textron Turf Care And Specialty Products has the most experienced lineup around.



On the field, our comprehensive line of mowers, aerators, infield rakes, utility vehicles, seeders and sprayers put up winning numbers. Off the field, easy maintenance and robust design keep them running for years. If you're ready to put some real winners on your field, call 1-888-992-TURF today or visit us at www.ttcsp.textron.com



BOB-CAT BUNTON CUSHMAN JACOBSEN RANSOMES RYAN

www.ttcsp.textron.com
AST-0100 © Textron Turf Care And Specialty Products.



Circle 107 on Inquiry Card

Compaction and Drainage

by Michael DePew

This article represents the first of three articles on soil compaction and drainage issues. In this first part, Michael DePew discusses and defines terms that will give the reader a better understanding of soil science principles relating to soil mechanics and soil strength principles.

Soil compaction is fundamentally a simple concept. Namely, the solid mass of a bulk soil volume is compressed into a smaller volume of the same mass. This results in an increase of solids and a decrease in void or pore volume. The decrease in total pore volume is normally accompanied by a redistribution of pore size toward finer pores. In general then, compacted soils will exhibit a higher proportion of finer pores that are subject to being water filled. Compacted soils can readily suffer from a lack of adequate aeration porosity.

To understand compaction and the conditions and circumstances that affect compactability, it is important to understand some basic principles of soil mechanics, namely soil consistency and soil strength relationships.

Consistency

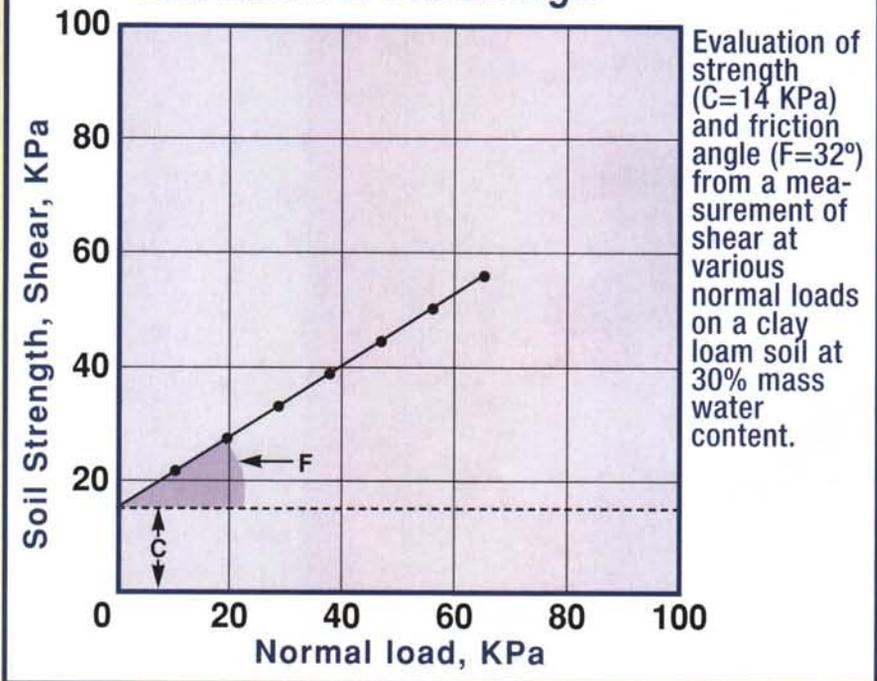
The physical state of soil—whether it behaves as a solid, plastic, or liquid—is referred to as consistence. Soils in the plastic state have the property of flowing after some threshold stress has been exceeded. In other words, plastic soil will deform under a stress or pressure without fracturing. Because plasticity is a characteristic imparted as a function of cohesive forces, not all soil is capable of exhibiting plastic behavior.

Granular coarse-textured soils such as sands offer little to no plasticity. The degree of plasticity that a given soil exhibits is a function of the water content of the soil. The lower

Table 1. Consistency limits for various soils

Texture	% Clay	Consistency, mass water content (%)		
		Shrinkage Limit	Plastic Limit	Liquid Limit
sandy loam	15	15	17	21
sandy clay loam	25	18	24	40
clay	50	10	32	59

Figure 1. Evaluation of soil strength



limit of plasticity (drier) is the point at which soil behaves more as a solid. The upper limit of plasticity (wetter) is the point at which soil behaves more as a liquid. The lower limit is

termed "plastic limit" while the upper limit is termed the "liquid limit." The difference between the two limits is called the plasticity index. In general, liquid and plastic limits increase with