Continued from pg. 11

height to 13/16 of an inch and switched to triplex reel mowers. This helped reduce some of the under-tarp moisture during the rehearsal period and set up the game day height.

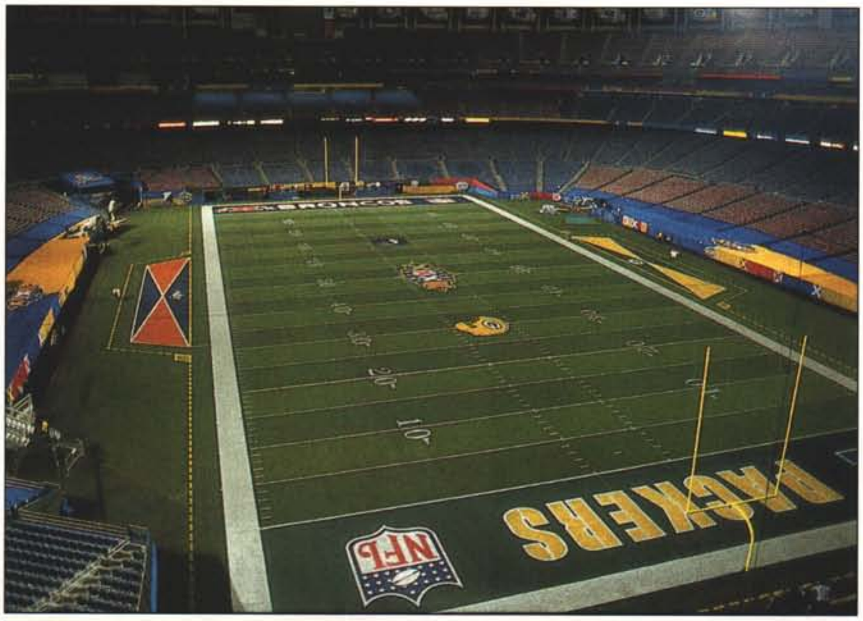
Of all the pre-game events, half-time show rehearsals caused the most extensive turf damage. George Toma presented a strong case for saving the turf for game day, but on-field rehearsal was not a negotiable point. To minimize the damage, crews had painted an exact replica of the field on the parking lot to host rehearsals.

600 people took to the field for the first on-field rehearsal, and the number doubled for the second. The 23-ton stage put further stress on the field, and rehearsals for the pre- and post-game shows brought even more trampling feet.

To prevent some of the damage, we took the six sections of tarp that covered the field, pieced them together and again painted the field on them. This allowed the field to be covered during on-field rehearsals, and the groups could still find their reference points without a problem.

The crew used the tarp for all on-field rehearsals. Each time we removed the cover, we dried the field with a combination of people power and helicopter force. We painted whenever an open time period presented itself. At times, wet paint had to be covered to accommodate rehearsals.

We dyed the field for the first time after rehearsal on the night of the 23rd. The turf had looked good going into the rehearsal cycle, but it showed poor coloration when the tarp came off. However, the overall plan had worked. The mature bermudagrass reinforced with the overseeded perennial ryegrass blend provided the dense bio-mass and good footing needed to support play.



By the time the event actually arrived, the crew had been stretched beyond their limits, but the NFL was able to present a top notch field to the world. Courtesy: Steve Wightman.

Finally, the crew followed favorable weather reports on Friday the 23rd, and rolled up the tarps. Saturday, January 24, we dyed the field again and painted it to give every blade of grass the appropriate color. The crew left the stadium at 7:00 a.m. on Saturday, and returned exactly 24 hours later to give the field its final, game-day coat of paint. We finished everything at noon, with little time to spare before the 3:20 p.m. kick off.

At 9:30 p.m. that night, after all the festivities had finally come to an end, most of the groundcrew went home to some much-deserved relaxation. However, some were not as lucky. Chip, George, Trevor and Ed headed directly to Hawaii to get things ready for the Pro Bowl. Only a core of seven stayed through Tuesday morning to pack up and load trucks for shipment back to the NFL offices in Kansas City. By Tuesday afternoon, all that was left was the aftermath.

Thanks for the Opportunity

Super Bowl preparation is a complex interaction of multiple forces all focused on the same goal: a top-notch game played on a top notch field. Coaches and players on the two competing teams, media representatives, and the world-wide audience demand and deserve it.

The groundcrew of this endeavor is just one piece of the massive puzzle. Our crew knew this was our home field, but they also knew it wasn't "our show." We were there to do whatever we could to fill assigned links in the master plan. That was what happened.

It was a long haul of hard work filled with cooperation, great camaraderie and a good measure of humor. It was a lot of fun at the start, but by the time the event actually arrived, we were spent. We stretched our humor and our energy to the limit, and it was worth every minute of it.

Every single member of the groundcrew team was ready, willing and able to do whatever it took to accomplish the job, however it needed to be done. George Toma's "and then some" ethic kept us going throughout. It was an exciting and unforgettable experience and we all were honored to play a part in it.

We say thanks to George Toma, Chip Toma, Trevor Vance, Ed Mangan and all the other NFL groundcrew players in Project Super Bowl XXXII.

Steve Wightman, Stadium Turf Manager; Bill Gibbs, Assistant; and crew members: Matt Balough, Victor Castenada, George Cubero, Doc Donovan, Resti Estacio, John Flores, Frank Garrido, Aaron Reyes, and Marty Reyes.

Battling Compaction

Aeration provides an effective defense against damaging compaction. Courtesy: File photo.

by Steve and Suz Trusty

You'll increase the odds of winning your battles against sports field compaction by understanding its causes and effects, by assessing your fields' reactions to it, by examining your options among the arsenal of weapons against it, and by matching your methods of attack with your fields' needs.

Back to the basics

Review this basic demonstration from Soils 101. Start with two small, dry sponges. Imagine each sponge is one of your fields. The solid portion of the sponge represents the clay, silt and sand components of your soil profiles. The open spaces represent the pores available for air or water.

Squeeze one of the sponges in your hand to the maximum compression your strength allows. The sponge becomes smaller as compression forces air from the pore space. This is what compaction does to your fields.

Release the sponge, allowing air to infiltrate the pore space and return the sponge to its original size and shape. You've just seen the results of aeration.

Now, get two small bowls, a cup half-full of water, and an assistant. Hold the first sponge over one of the bowls and squeeze it again. Have your assistant pour the water over the compressed sponge. You'll notice that only a small amount of the water will soak into (infiltrate) the sponge. Because limited pore space is available, the majority of the water will run off into the bowl.

Continue to squeeze the sponge. Have your helper refill the cup to its half-way point. Place the second, fully expanded dry sponge in a small bowl and pour the water over it. Because more pore space is available, more water will infiltrate this sponge, and very little water will run off.

Have your assistant quickly pick up the moist sponge. Pour the excess water back into the cup, and place the sponge back in the bowl. Leave the sponge in the bowl for a minute or two while you continue to compress the first sponge in your hand.

Now examine the sponges. Both will show water movement (percolation) down into the sponge from the point of entry (infiltration point). However, because more pore space is available in the second (uncompacted) sponge, the percolation rate will be greater than that of the first (compacted) sponge.

Obviously, compaction in your fields is a bit more complex, but the basic principles are the same. Compacted soil profiles "squeeze out" the pore space needed for the air, water and nutrients necessary to support turf growth and survival.

Understanding your fields

Field soil profiles vary greatly from facility to facility, among the various fields of multi-field facilities, and even within individual fields. To develop an effective compaction management program, you must first define each individual field's soil profile and understand how that soil profile reacts to the stress of use and to maintenance practices.

You'll remember from Soils 101 that the three primary soil components - sand, silt and clay - vary greatly in size. Remember those boxes of basketballs [sand], baseballs [silt] and marbles [clay] in the particle size demonstration? There are ever fine, medium and coarse size variations among the different components.

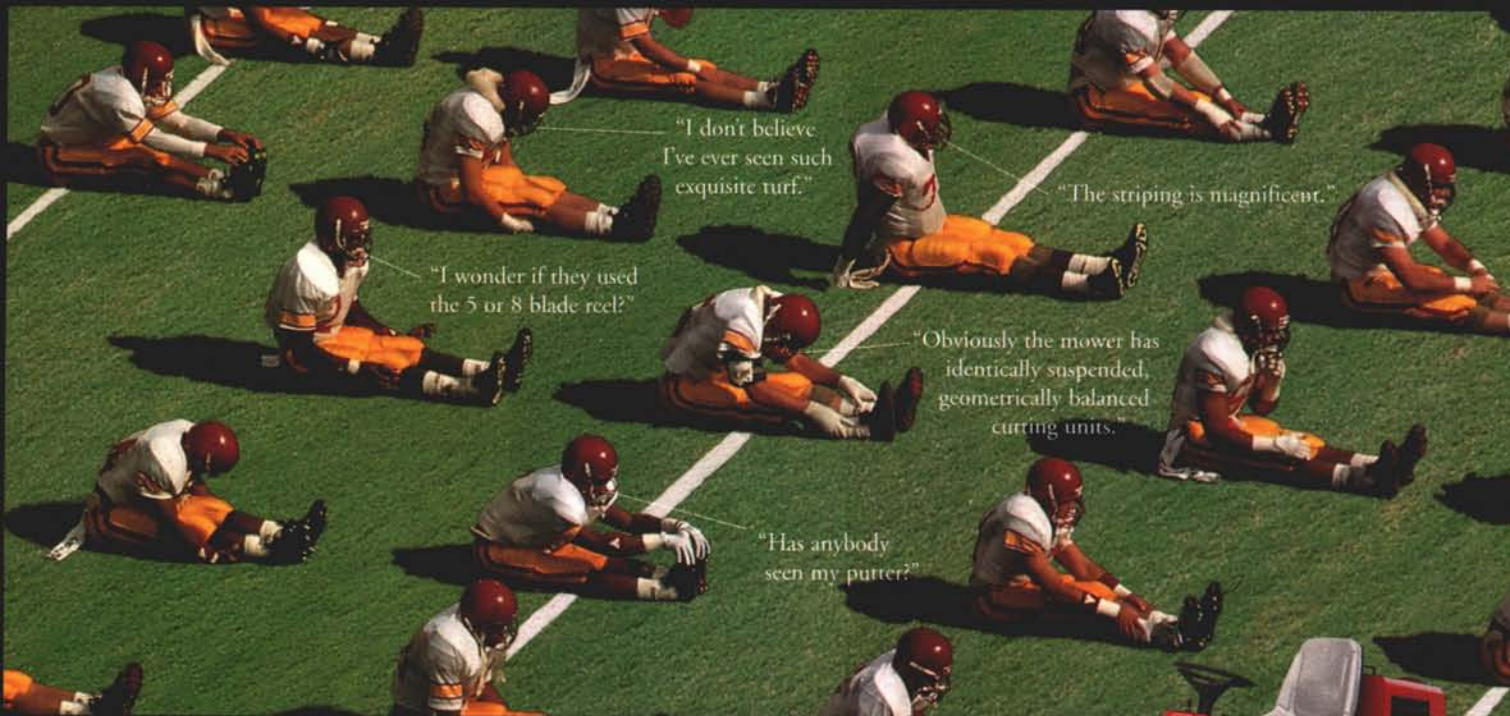
The smaller silt and clay particles fit together tightly and leave fewer pore spaces between particles. The larger sand particles fit together loosely and allow more pore spaces between particles.

Both clay and silt are defined as plastic components, while sand is non-plastic. Physics defines plastic components as those capable of continuous and permanent change of shape in any direction without breaking apart. Plasticity causes clay and silt to change shape and squeeze together under the pressure of compression. Non-plastic sand retains its shape during compression and retains its greater pore space.

When silt, clay and sand are mixed in the soil profile, smaller particles move into the pore spaces between larger particles. Thus, it takes a high proportion of the right type of sand to significantly increase available pore space and improve field compaction resistance.

OFFICIAL TURF CARE PROVIDER TO
DISNEY'S WIDE WORLD OF SPORTS™ COMPLEX

SUDDENLY THE 50 YARD LINE FEELS A LOT MORE LIKE A FAIRWAY



INTRODUCING THE NEW TORO GROUNDS PRO

GOLF COURSE QUALITY WITHOUT THE GREENS FEES

The new Grounds Pro™ 2000 is the first reel mower designed for sports fields. It features a reel blade design that gives you a smoother, more professional cut than a rotary. Yet, unlike reel mowers made for the golf course, the Grounds Pro is designed to fit the budget constraints most sports field managers face. And its value grows when you add any of its productive attachments. Ask your Toro distributor about the Grounds Pro or check it out at www.toro.com/grounds/sports.

TORO® GROUNDS PRO™

It's about productivity

Circle **107** on Postage Free Card

Sports field soil profiles may also contain such materials as organic amendments, diatomaceous earth, calcined clay, synthetic fabrics, synthetic fibers, rubber or other granules and industrial bi-products. With organic materials, physical properties tend to be unstable, and they can cause the physical properties of the soil profile to change.

Assessing the problem

When you understand the physical components of each of your fields, the next step is to monitor each field's reaction to your current maintenance program. You'll need to note variable factors such as regional weather patterns and the use schedule of each field. It's also important to factor-in the specific characteristics of each field's location, including shade and sun patterns, wind patterns, and lack of air movement.

Compaction may be a problem over an entire field, or it can be confined primarily to high use segments. It's time to take action when it adversely affects turf growth, water infiltration, percolation or drainage, or when it creates a hard surface unsuitable for athletic activity.

While it is the most disruptive of the aeration practices, core aeration opens up the greatest amount of pore space and has the longest lasting effect.
Courtesy: Trusty & Assoc.

Comparing your options

"Core" aeration removes plugs of turf and soil from your fields. Aeration depths of three to four inches are common, and the number of passes over an area determines the number of cores pulled. While it is the most disruptive of the aeration practices, core aeration opens the greatest amount of pore space and has the longest lasting effect.

Different equipment options allow you to choose the pattern of coring and the spacing between cores. You can also customize diameter and depth of cut through equipment choice. Quality equipment will deliver consistent spacing and depth, and will cause minimal surface scuffing.

Core aeration is often combined with topdressing of material that matches the existing soil profile and improves compaction resistance. In addition, removed cores may be broken up on the soil surface and dragged across the field to be recycled.

Solid tine or "spike" aeration pokes holes rather than pulling cores. As in the case of core aeration, a range of equipment offers choices in the diameter and length of the tines and in the spacing of the holes. Spiking gives less soil surface disruption, but delivers less compaction relief than does core aeration.

Deep tine, or "shatter" aeration reaches further into the soil profile (often 8 to 10 inches or more). It's used to break through barriers of compaction or layering that stem from long-term aeration to a specific depth and layers of varying materials within the soil profile.

Verticutting blades slice through turf into the upper layer of soil to open narrow slits of pore space. The technique provides less pore space than coring or spiking, and the degree of surface disruption varies with the condition of the turf and its root depth.

High pressure water injection is another form of aeration. Depending on the equipment used, depth of soil penetration can vary from one inch to as much as eight to 10 inches or more. The units often offer multiple variations for spacing the injections. Pores obtained through water injection tend to be quite small, but multiple passes can be made with the equipment to fully aerate the field.

Removed cores may be broken up on the soil surface, and the material can be dragged across the field. Courtesy: Trusty & Assoc.

With any of these methods, the timing of aeration is critical to turf performance. Actively growing turf recovers more quickly than turf that is in a state of dormancy.

Matching methods to needs

Each of the mentioned aeration methods has its place in sports turf maintenance. Method selection for a particular field must be based on multiple factors: the condition of the individual field, the season of the year and anticipated weather conditions, field use schedules, the availability of equipment, and budgetary and labor constraints. An individual field may even require the use of multiple aeration methods to reach its optimum potential.

As is the case with most aspects of field maintenance, the sports turf manager must communicate with field users and user groups to make an aeration program effective. By limiting excessive turf wear and restricting field use in potentially damaging situations, it's possible to attack compaction before it occurs. ❑

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

Now Hear (?) This.

Introducing the first and only ultra-quiet electric-powered athletic field conditioner

THE ALL-NEW CONCEPT FOR PROFESSIONAL FINISHING

CHOICE OF COOPERSTOWN'S FAMOUS DOUBLEDAY FIELD

For quieter, faster, easier field conditioning ▪ No engine, no fluids, no pollution, no noise ▪ Battery-powered operation, with overnight recharging ▪ Very little maintenance ▪ Power and quick maneuverability ▪ And a variety of implements for all types of surfaces ▪ See it, drive it, hear (?) it - the All Star E.

SMITHCO 30 YEARS ENGINEERING SUPERIORITY

ALWAYS OUT FRONT

SMITHCO

WAYNE, PENNSYLVANIA 19087

Circle **110** on Postage Free Card

Slit Drainage: A Cutting-Edge Tool in Sports Field Construction and Renovation

by François Hébert

Poor drainage is at the root of many problems plaguing sports fields today: turf grass disease, low wear resistance, soil compaction and related problems, poor playing quality, high maintenance costs; the list goes on and on. With all of its effects on the overall quality of fields, drainage is certainly one of the greatest challenges facing today's sports turf manager.

Water-related turf damage is usually caused by failure to remove surface water, which causes puddling and saturation of the soil. Some specialized construction techniques, such as sand carpet and suspended water table, have been developed to alleviate these problems and shortfalls. Still, most installations are constructed following traditional methods of drainage, specifically surface and sub-surface drainage.

Modern slit drainage equipment limits installation time even in existing fields by simultaneously cutting, excavating, and filling slits in one pass. Courtesy: Lanco.

The former is effective in situations where slope is sufficient to move surface runoff. For this technique to be effective, water must sometimes cover great distances to exit the playing surface. Often, great amounts of water permeate the soil in the process. Since it is most often used in conjunction with slow draining native soils, this technique is by far the least effective.

On the other hand, sub-surface drainage depends mostly on the soil's ability to transmit water through pores in the surface. Poor granular distribution and compaction directly effect this type of drainage system.

Slit drainage stands halfway between these two approaches. It offers a cost-effective solution to severe drainage problems effecting existing turfgrass surfaces. It also provides an innovative drainage option in new constructions.

One could say that slit drainage is among the best kept secrets of sports field construction and maintenance, despite the fact that the technique has been around for more than thirty years. In recent years, slit drainage has undergone great technical evolution, and today it stands as an interesting and practical tool for solving many of the problems associated with excess water on intensively used natural surfaces.

Collecting surface runoff

A typical slit drainage installation consists of a series of narrow trenches cut into the playing surface with a huge trenching wheel. These drainage slits are filled with a drainage medium, such as pea gravel, fine crushed stone, course drainage sand or a combination of these.

The drainage slits are typically cut between two and three inches wide. Any narrower and they tend to clog up with time. Any wider and grass will have difficulty surviving over the fin-

continued on page 27