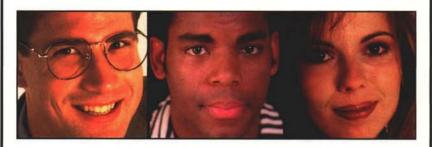
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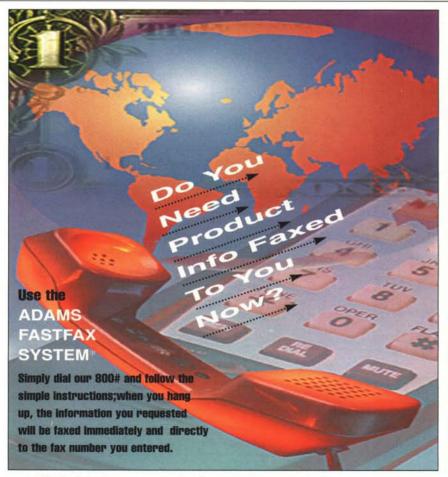


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Warm season grasses

Photosynthesis is more efficient in warm season grasses than in cool season grasses. As temperature and light increase, so do shoot and root growth. Optimum temperatures for warm season root growth range from 75 to 84 degrees Fahrenheit; while those for optimum shoot growth range from 81 to 95 degrees Fahrenheit. Root initiation and activity peaks in late spring and summer. When temperatures cool, root and shoot growth slow. When the plant enters dormancy, root growth ceases. The peak loss of roots for warm season grasses is in late winter.



Dense, fibrous, healthy roots growing in the modified sand rootzone of a multi-use field.

What Do Turfgrass Roots Do?

Roots absorb water

Roots are the principal entryway for the water needed to maintain turgor and for photosynthesis and many other processes in the plant. Water is needed to replace that lost through transpiration and through mown leaf ends.

Roots absorb nutrients

While carbon, hydrogen and oxygen—the main building blocks of organic compounds—are derived from the atmosphere and from water, the remaining 13 essential mineral nutrients are principally absorbed from the soil by the roots. Nutrients do not just "seep into" or passively move into roots; nutrient absorption requires energy. This energy comes from respiration: the breakdown of carbohydrates in the presence of oxygen with a subsequent release of the energy captured by the plant in the process of photosynthesis. When carbohydrate reserves are low or unavailable, roots will not have the energy needed to absorb nutrients. Deep, extensive root systems are able to access more nutrients as well as water from a larger volume of soil.

Roots anchor plants

Plants with deep and extensive root systems contribute to a stable playing surface and are less likely to rip out from divoting.

How Can You Enhance Root Growth?

Monitor development

Inspect the root system frequently. Note its depth and distribution and how that relates to time of year, climate and management practices.

Maintain a well-aerated root zone

Depth and extent of roots and root branching increase in a well-aerated rootzone. Roots expend less energy as they bore through a non-compacted soil. Roots in poorly aerated soil tend to be thicker in diameter and less branched and are inefficient at water and nutrient uptake.

Irrigate intelligently

Space irrigation events as far apart as possible without sacrificing turf quality. Turf watered deeply and infrequently has been shown to have a deeper, more extensive root system with a higher level of carbohydrate reserves than turf watered frequently and shallowly.

Fertilize judiciously

Provide adequate nutrients at the proper time. Apply potassium before expected stresses of heat, cold and drought.

Time nitrogen applications to maximize root growth while maintaining a healthy balance in root growth and shoot growth. In cool season grasses, nitrogen applications in late summer and late fall will result in an increase in rooting while spring and especially summer applications will result in an increase in shoot growth with a corresponding reduction in rooting. Cool season grass roots have the ability to store some nitrogen applied in the late fall for use when growth resumes vigorously in the spring. Avoid overly stimulating shoot growth during periods environmentally unsuitable for root growth (i.e. in the summer for cool season grasses).

The balance between shoot growth and root growth in warm season grasses is less affected by timing of nitrogen applications.

Maintain soil pH from 6.0-7.0

Turfgrass roots grow very poorly at reduced pH, especially at pH of 5.0 and below.



Sports play and traffic on wet fields can compact the soil, making root growth very difficult.

Mow appropriately

Mow cool season grasses as high and as infrequently as possible given the use of the turf. This is especially important during times of environmental stress. Constant defoliation by frequent mowing reduces the photosynthetic potential of the turf depleting carbohydrate supplies available for root growth. Cool season grasses are especially sensitive to this. Low mowing can dramatically reduce the depth and extent of roots of cool season grasses, though bentgrass is not as severely affected as the others.

Warm season grasses are less affected by low mowing. Bermudagrass especially will tolerate low mowing without significant reduction in rooting.

Take care with herbicide use

Avoid using herbicides when turf is under stress or when root growth is restricted as such turf may be more seriously damaged and take longer to recover than healthy turf. Bensulide, benefin, oxadiazon, oryzalin, pendimethalin, prodiamine, siduron, DCPA and other herbicides may inhibit root growth.

Conclusion

Roots are the foundation of a turf. Attention to the growth, development and health of the root system by the turf manager can ensure a deep and extensive root system able to sustain a vigorous, properly performing playing surface.

Mary Owen is extension educator and turf specialist for the University of Massachusetts, Amberst, Mass. She is a past STMA Board Member and an active member of the STMA Certification and Conference Committees.

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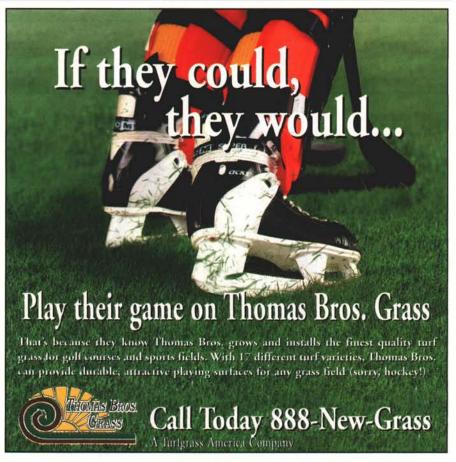
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Circle 118 on Inquiry Card

A Chapter Is Born MAIN ASSIGN

auffman Stadium, home of the Kansas City Royals, opened its doors on Saturday morning, April 1, for the first official seminar of the newly forming MO-KAN Chapter. This group is based in Kansas City and intends to serve the surrounding Missouri and Kansas areas. Despite the cool morning air and the weatherman's threat of rain, around 100 attended the event. The core group of chapter organizers demonstrated their enthusiasm with warm smiles, a well-orchestrated registration system and lots of donuts. With attendees gathered in the stands, Royals Head Groundskeeper Trevor Vance welcomed the group to a field he, Assistant Groundskeeper Jon Reed and their

Andre Bruce, far left, of the Kansas City Chiefs, discusses aeration techniques with the group at his station.

top-notch staff had in its prime, ready and waiting for opening day. STMA President Rich Moffitt and Executive Director Steve Trusty presented a brief overview of STMA and its services. Vance outlined the plans for chapter development, noting they would be discussed in detail during the lunch gathering.

Vance then explained the format for the program. Separate stations had been set up at home plate, third base, the dugout entrance to the irrigation system pump room and all around the warning track. Each station had a designated topic, from an explanation of the field's irrigation system, details of the maintenance equipment used, plate and mound preparation and repair details, skinned area dragging techniques, field painting techniques, fertilizer application patterns and topdressing programs and techniques. Vance, Reed, Royals grounds crew members, Kansas City Chiefs Head Groundskeeper Andre Bruce, Grounds Coordinator for the Blue Valley (Kansas) School District Jody Gill and numerous vendor personnel served as the presenters and discussion leaders at each of the stations.

Vance invited the attendees to split into small groups, with each group heading for a different station, and then rotating to the next station in a clockwise direction at the signal to move. This gave everyone the opportunity to see each of the demonstrations and hear all the presentations. The stadium buzzed with discussion as the groups and presenters interacted in the question, answer and idea exchanges at each of the stations.

As noon approached, members of the Royals grounds crew broke out the grills and started cooking. Attendees then gathered at the grounds department's office and shop area to fill up on the great lunch, learn more about the forming chapter, sign on as members and join in the drawing for Kansas City Royals balls, hats, clothing and other donated door prizes. Hats off to the MO-KAN Chapter organizers. It was an excellent kickoff meeting.

Tennessee Valley Sports Turf Managers Association

TVSTMA met on March 3 at Vanderbilt University. Approximately 30 attendees gathered for the seminar. Host for the event was Bill Randles, sports turf manager for Vanderbilt University. Seminar speakers included Robert Bodi of Hard Four, Inc. and Dr. Richard Large of A & L Analytical Laboratories.

The opportunity to visit other facilities and gain first hand information on their athletic field programs is always a



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highlight of such chapter meetings. Attendees posed for a photo on Vanderbilt's newly renovated natural grass football field during the tour segment of this event.

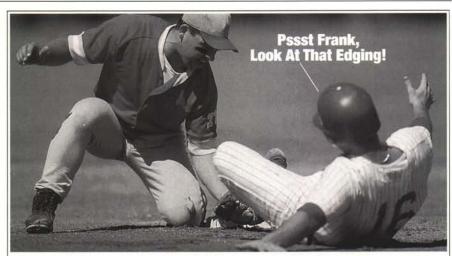
Chapter News

Florida: The chapter will meet on July 18 at the Town of Lantana. The education theme is "Overseeding Sports Fields and Maintaining High Wear Athletic Field Areas." A tour of the Town of Lantana's athletic fields will be included in the program. The Florida Chapter also will have a booth at the Florida Turfgrass Association meeting on Aug. 15 and 16. For information on the Florida Chapter or pending activities, contact John Mascaro at (954) 341-3115.

Colorado: The chapter will hold a Baseball Seminar on May 17 at Larry Walker Field in Aurora, Colorado. The seminar will include speakers from Clement Park, adjacent to Columbine High School, and will detail their renovation of the park following the thousands of visitors last spring. Among other Seminar speakers will be representatives from Metro State College, 1998 College Field of the Year. In the planning stages are the second annual Seminar on Wheels and an August 3 Football Seminar at Folsom Field on the University of Colorado campus. For information on the Colorado Chapter or upcoming activities, log on to the chapter's Web sitewww.cstma.org-or call the CSTMA Chapter Hotline: (303) 346-8954.

Minnesota: The Iowa/Minnesota Sports Turf Managers Chapter Challenge will be in Des Moines, Iowa, with the Golf Challenge on July 14 and the Softball Challenge on July 15. The Minnesota Chapter's annual Tour on Wheels will be held on July 26. Already on the agenda are a stop at St. Olaf College to check out the new softball field and closing the event by attending the evening St. Paul Saints game. For information on the Minnesota Chapter or upcoming events, contact Ron Werner at (507) 634-1176.

Midwest: The chapter will meet on May 18 at the Kane County Cougars Stadium in Batavia, Ill. Events will begin with a pre-game preparation demonstration by Head Groundskeeper Sarah Martin. This will be followed at 4 p.m. by a picnic social. Attendees are welcome to stay for the Cougars' evening baseball game. July 11 is the date of the Multi-chapter Meeting to be held at the University of Notre Dame campus. The morning's educational



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sessions will be followed by lunch and an afternoon tour of the athletic fields and facilities conducted by Dale Getz, CSFM. For information on the Midwest Chapter or pending activities, call the chapter hotline, (847) 622-3517.

Great Lakes: The chapter will hold a Field Day with the Columbus Crew on May 20. Activities will include a tour of

the facility, educational sessions and attendance at the game between the Crew and the Dallas Burn. GLSTMA and MiSTMA will hold a joint Tour on Wheels on July 18. Sites will include the new Comerica Park and two high school locations with Birmingham Public Schools. Attendees will end the day by catching the game between the Detroit Tigers and Cincinnati Reds. The chapter will participate in two August events: the Ohio State University Extension Day at Owens Community College on Aug. 2, and the Ohio Turf Foundation Research Day at the

OTE Research Center in Columbus on Aug. 9. For information on the GLSTMA Chapter, the chapter's Field of the Year Program or upcoming events, contact Joe Zelinko, at (800) 897-9714, Boyd Montgomery, at (419) 885-1982 the chapter's Web site.

Iowa: The chapter will hold their Wheels Tour 2000 on June 8 in Cedar Rapids, Iowa. Registration begins at 9 a.m. at Vets Memorial Stadium, with the tour of that facility beginning at 9:30 a.m.. Other tour sites include Kingston Stadium, Twin Pines Golf Course for a topdressing demonstration, Bluegrass Enterprises for lunch and a sod demonstration and Xavier High School. ISTMA will hold a Vendor Workshop at Iowa State

University on June 21 with registration beginning at 8 a.m. Four concurrent sessions are on the morning program, each discussing principals and demonstrations: Dr. Dave Minner with mowing; Mike Andresen with aeration; Don Larson with topdressing; and Dale Roe with painting. Next on the program will be lunch with the "Vendors on Parade," During the afternoon session, from 1:30 to 4 p.m., 30 minute presentations at five separate stations will be repeated five times, allowing participants to visit each station. The stations are:

Calibrating Spreaders, Calibrating Sprayers, Irrigation Repairs, Renovation Seeding Principles and the Vendor area. The chapter also will participate in the Iowa Turfgrass Field Day on July 13 at the ISU Horticulture Research Station in Ames, Iowa. The Iowa/Minnesota Sports Turf Managers Chapter Challenge will be in Des



Members of the Tennessee Valley Chapter of the STMA

take a minute to smile for the camera at their chapter

meeting at Vanderbilt University on March 3.

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Moines, Iowa, with the Golf Challenge on July 14 and the Softball Challenge on July 15. For information on the Iowa Chapter or upcoming activities, contact Lori Westrum at The Turf Office at (515) 232-8222 (phone), (515) 232-8228 (fax) or e-mail: Lori@iowasturfgrass.org.

Michigan: The chapter will hold its Annual Summer Conference on June 22 at the West Ottawa Public Schools in Holland, Mich. GLSTMA and MiSTMA will hold a joint Tour on Wheels on July 18. Sites will include the new Comerica Park and two high school locations with Birmingham Public Schools, with the tour ending with the game between Detroit and Cincinnati. For information on the chapter or pending events, contact Rick Jurries, West Ottawa Public Schools, at (616) 395-2364 or click on your computer to www.mistma.org to

Indiana: The chapter will meet on May 16 at the Indiana Purdue University Fort Wayne Campus. The meeting will include a tour of the soccer fields that were installed in 1999 and are being readied for play. July 11 is the date of the Multi-chapter Meeting to be held at the University of Notre Dame campus. The morning's educational sessions will be followed by lunch and an afternoon tour of the athletic fields and facilities conducted by Dale Getz, CSFM. For information on the Indiana Chapter or pending activities, contact Terry Updike, B & B Fertilizer, at (219) 356-8424 or Pat Hickner at (800) 672-4273.

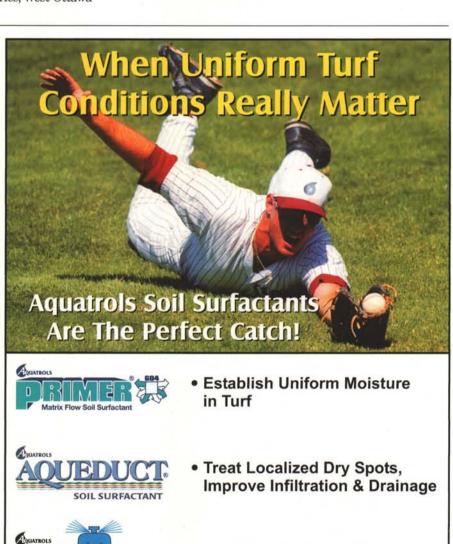
North Texas: NTSTMA will meet on June 14 at the Ballpark in Arlington, home of the Texas Rangers Baseball Club. For information on the North Texas Chapter or pending activities, contact: Rene Asprion, Diamond Pro, at (800) 228-2987 or Dr. James McAfee, Texas A & M University, at (972) 952-9220, or log onto www.ntstma.org to check out the Web site.

visit the chapter's new Web site.

Gateway: The chapter is planning a June meeting at John Burroughs School. Irrigation management will be the meeting focus. More information will be announced soon. For information on upcoming events or on the chapter, contact Jim Anthony, Saint Louis University, at: (314) 977-3228.



Attendees gather at the kickoff meeting of the forming MO-KAN Chapter of the STMA at Kauffman Stadium, Kansas City, Mo.



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Trevor Vance, third from left, points out techniques of infield skinned area maintenance as staff members demonstrate the process.

KAFMO: The chapter, along with the Penn State Cooperative Extension, will co-sponsor a Summer Field Day on Aug. 16 at the Brandywine Picnic Park in Pocopson, Penn. The theme is "Everything for Athletic Fields." Events will include equipment demonstrations, test plots, panel discussions and an all you can eat pig roast. For information on the KAFMO/STMA Chapter or upcoming events, contact Dan Douglas, Reading Phillies Baseball Club, at (610) 375-8469, extension 212 or via the chapter e-mail address: kafmo@aol.com.

MAFMO: For information on the MAFMO Chapter or pending activities, contact the chapter's hotline: (410) 290-5652.

Arizona: The chapter will meet in Tucson on June 29. Along with educational sessions, events include a tour of the Rainbird Irrigation Plant. Events conclude with the 7 p.m. ballgame of the Tucson Sidewinders, AAA affiliate of the Arizona Diamondbacks. July and September meetings are in the planning stages. For information on upcoming events, contact Bill Murphy, City of Scottsdale park, recreation and facilities manager, at e-mail: bmurphy@ci.scottsdale.az.us or phone: (480) 312-7954.

Wisconsin: For more information on the Wisconsin Chapter or pending events, contact Rich Riggs, R. H. Rettler & Associates Inc., at (715) 341-2633.

Northern California: The chapter event is the annual fall seminar, "The Greatest Show on Turf." It will be held on August 8 at the San Jose Municipal Stadium, home of the San Jose Giants, a San Francisco Giants farm club. Scheduled activities include sports field maintenance demonstrations, vendor exhibits and attendance at the ball game between the San Jose Giants and the Stockton Ports. For information on the Nor-Cal Chapter or pending events, contact Janet Gift at (530) 758-4200.

Southern California: For information on the Southern California Chapter or pending activities, contact the chapter hotline: (888) 578-STMA (toll free in Southern California).



Each Station located around the ballpark had a designated topic and leader to stimulate discussion among the groups.

Mid-South: For information on the Mid-South Chapter or upcoming events, contact Robert Bodi by e-mail at Turf419@aol.com or call Jim Calhoun at (901) 755-1305.

Tennessee Valley: For information on the TVSTMA Chapter or upcoming events, contact Bill Marbet, Southern Athletic Fields Inc., at (913) 380-0023 or Bob Hogan at (888) 224-6426.

Chapters On The Grow

New York: A chapter is taking shape in Central New York. Interested? Want more information? Contact Kevin Meredith, National Soccer Hall of Fame, via email at Kevin@wpe.com or by phone at (607) 432-2953.

Kansas City, MO/KS: For information on MO-KAN, the newly forming chapter or on upcoming events, contact Trevor Vance at (816) 504-4271; Gary Custis at (816) 460-6215; Jay Sutton at (816) 795-8873; or Jody Gill at (913) 681-4121.

Nebraska: A new chapter is taking shape in Nebraska. For information on the Nebraska Chapter or upcoming events, contact Greg Bostelman, City of Grand Island, at (308) 385-5426.

New Jersey: For information on this forming chapter or upcoming events, contact Jim Gavigan, Lesco, at (732) 248-8979 or Eleanora Pene, Director, Township of Clinton Parks & Recreation Department, at (908) 735-5999.

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