



Chandler Arizona Parks Department

Chandler, Arizona



Chandler Arizona selected Primavera bermudagrass for all fifteen of the new soccer fields they seeded in 1994 and 1995. In addition, they are using Primavera on all the city parks and grounds.

According to Kris Kircher, maintenance coordinator, they have used common bermudagrass before but had problems with allergic reactions among the players. Then they tried Mid-iron bermudagrass but it was very susceptible to pearl scale. The third variety they tested was Primavera. Kris was really impressed with its quick germination and establishment. It stayed greener longer in the fall and greened-up earlier in the spring than any of the other seeded types they tested. Primavera also was resistant to pearl scale, so their problems were solved.

Kris, and his crew of four, were able to convert old cattle corrals to excellent quality soccer fields. The San Tan Soccer Association plays on the fields nine months out of the year, and with the use by other groups, there are soccer games almost every day of the week throughout the entire season. The quality of the playing surface is excellent throughout the year. The number of injuries and loss of players have been greatly reduced with the dense turf they are able to produce with Primavera. It has been stated by numerous authorities that Chandler has the best soccer fields in the Phoenix area.

The work done by Kris and his crew is impressive, especially when one realizes that it was done on a minimum budget.

“Primavera is a high quality, lower cost alternative to the standard turf varieties sold only in sod or stolon forms.” *Kris Kircher, Maintenance Coordinator*



Professional Turf Center—Dallas, Texas
(214) 905-1020 • In TX (800) 590-4333



dryROOTS™ and **ROOTS 1+2+3™** were a big help in our renovation of Tiger Stadium and our baseball field at Louisiana State University.

We now use **ROOTS 1+2+3™** as part of our regular maintenance program.

Jeff Kershaw
Supervisor of Athletic Fields and Stadiums

Call 1(800) 817-1889 use *Fast Fax# 1020997*
and/or Circle 102 on Postage Free Card

roots inc. A Division of LISA Products Corporation • 3120 Weatherford Road • Independence MO 64055 • 800 342-6173

sportsTURF

PROGRAM



THE OFFICIAL PUBLICATION OF THE
SPORTS TURF MANAGERS ASSOCIATION

STMA OFFICERS

PRESIDENT MIKE SCHILLER
PAST PRESIDENT GREG PETRY
PRESIDENT-ELECT STEPHEN GUISE
COMMERCIAL VICE PRESIDENT HENRY INDYK, PH.D.
SECRETARY EUGENE MAYER
TREASURER RICH MOFFITT
STMA BOARD MEMBERS L. MURRAY COOK,
BUCKY TROTTER, MARY OWEN, BOB PATT, BOB CURRY
EXECUTIVE DIRECTOR STEVE TRUSTY
STMA OFFICE
1375 ROLLING HILLS LOOP, COUNCIL BLUFFS, IA 51503
PHONE: (800) 323-3875
E-MAIL: TrustyTips@aol.com
WEB SITE: <http://www.aip.com/STMA>

MAGAZINE STAFF

VICE PRESIDENT/GROUP PUBLISHER COLLEEN MURPHY
EDITOR JIM WILLIAMS
EDITORIAL DIRECTOR JERRY ROCHE
EQUIPMENT EDITOR DANIEL INGHAM
PRODUCTS/NEWS EDITOR JAMES ALDERSON
ACCOUNT EXECUTIVE DEANNA MORGAN
INTERNET MARKETING SERVICES GRETCHEN WAGNER
NATIONAL ACCOUNT SALES LIZ RICHARDS, MARSHA DOVER
LIST RENTAL JAN LEONARD PH: (847) 427-2091
FAX: (847) 427-2006

CIRCULATION MANAGER ROB HARKEY

PRODUCTION

DIRECTOR/PRODUCTION DON FERREIRA
PRINT PRODUCTION COORDINATOR AMELIA ZAMUDIO
AD TRAFFIC COORDINATOR BRIAN SCHNEDEEN
GRAPHIC DESIGN DARYL JACKSON
MANAGER WEB PRODUCTION DEBORAH A. BELLE

SUBSCRIPTION SERVICES CALL (609) 786-6805

ADVERTISING AND EDITORIAL OFFICES

68-860 PEREZ RD., SUITE J, CATHEDRAL CITY, CA 92234
(760) 770-4370; Fax (760) 770-8019

ADAMS BUSINESS MEDIA

PRESIDENT MARK ADAMS
VICE PRESIDENT/OPERATIONS PEGGY BILOUS
CHIEF FINANCIAL OFFICER G. PATRICK O'DOWD
DIRECTOR OF HUMAN RESOURCES MARGIE DAVIS
DIRECTOR/INTERNET DEVELOPMENT GARY CORBETT
DIRECTOR/MIS SUZANNE DELAHANTY

sportsTURF Magazine (ISSN 1061-687X) is published monthly by Adams Business Media. Material in this publication may not be reproduced or photocopied in any form without the written permission of the publisher.

Copyright © 1997. Member of the
Business Publications Audit of Circulation, Inc.



SUBSCRIPTION RATES

ONE YEAR \$40 TWO YEARS \$65
FOREIGN (ONE YEAR) \$65 • \$130 Airmail or Single Copy \$5

CHANGE OF ADDRESS AND SUBSCRIPTION INFORMATION
Provide old mailing label and new address; include ZIP or postal code.
Allow 6-8 weeks for change. Send correspondence regarding subscription
service to: sportsTURF, P.O. Box 10515, Riverton, NJ 08076-0515,
(609) 786-6805.

PERIODICALS POSTAGE PAID at Cathedral City, CA and at
additional mailing offices.

Postmaster: Please send change of address to sportsTURF,
P.O. Box 10515, Riverton, NJ 08076-0515.

VOLUME THIRTEEN, NUMBER NINE

SEPTEMBER 1997

MAIN EVENTS

8 Training Yourself and Your Crews to the Top of the Field

Just as you try new fertilizers and herbicides, retrofit an existing irrigation system or expand the memory of your computer, you need to upgrade your own capabilities and those of your teammates. Dr. Gil Landry outlines the educational and training opportunities available and tells how to make the most of them.

14 De Anza Zoysia: A New Turfgrass for Sports

An experimental hybrid will be unveiled and begin Major League testing this winter when De Anza zoysiagrass is planted in Phoenix for the new Arizona Diamondbacks baseball franchise. If it lives up to expectations, sports-field managers will have a new wear resistant grass for shaded and other difficult-to-maintain sites.

18 Flinn Wins High School Football Field of the Year

Hub of a multi-use complex developed almost 20 years ago by the forward-thinking, sports-minded community of Quincy, Ill., Flinn Memorial Stadium houses a sand-based field intended to support heavy use. It gets it, and not only survives but flourishes under the guidance of sports turf manager Kurt Knuf, whose efforts earned the 1996-1997 STMA High School Football Field of the Year Award.

24 Effective Overseeding North and South

Down South, overseeding means adding ryegrass to bermudagrass so fields stay green during colder months. Up North, it means applying seed to thicken turf. Wherever it's located, overseeding can make your field a showplace, if you follow a few simple rules and correctly time your applications.

LINE-UP

6	Front Office	32	Applicator's Log
6	Tip o' the Month	40	Rookies
7	STMA Message	41	Classifieds
10	STMA in Action	41	Ad Index
22	Calendar	42	Front Lines

On the Cover:

Members and guests of the Iowa Sports Turf Managers Association receive hands-on training in baseball field maintenance during a workshop at Des Moines' Sec Taylor Stadium, home of the AAA Iowa Cubs. Photo courtesy: Trusty & Associates.



73,656 seats at the stadium, but only one is padded.

Unsurpassed comfort, convenience and performance. That's why you can find the Jacobsen Tri-King™ on world-famous playing surfaces like Sun Devil Stadium in Tempe, Arizona—home of the 1996 Tostitos® Fiesta Bowl™ and Super Bowl XXX®. Premier groundskeepers count on it to deliver a precision cut on all types of grasses. And operators like the comfortable seat, easy-to-reach

controls and handy steering wheel. Ask your Jacobsen distributor for a demonstration today.



THE PROFESSIONAL'S CHOICE ON TURF

JACOBSEN

TEXTRON

800-727-JAKE www.jacobsen.textron.com

Call 1(800) 817-1889 use **Fast Fax# 1030997**
and/or Circle 103 on Postage Free Card

THE FRONT OFFICE

OPINION PAGE



Dealing with Stress

Thanks to the "Applicator's Log" this issue, I think I understand better some of the "cutting edge technologies" that have been lumped under the term "biostimulant." The term's been applied both to true biostimulants (plant hormones) and to humic acids (which include plant hormone-like activity among their effects).

Although biostimulants and humic acids are non-nutritive substances, containing little N, P or K, they're worth a sports turf manager's consideration — especially biostimulants, according to Dr. Richard J. Cooper of North Carolina State University. At STMA's last conference, Dr. Cooper recommended biostimulants as a way to help sports turf during times of stress and noted that cool-season varieties respond especially well.

About humic acids, Dr. Cooper is not quite as enthusiastic. Most research showing the beneficial effects of humic acids has been on plants other than turfgrasses, so he cannot recommend humic acids as a definite help. Instead, he recommends that sports turf managers themselves test humic acids by buying a sample, treating an area and comparing it against an untreated area. If your results match up with a study Dr. Cooper conducted on Crenshaw bentgrass, you'll see a significant gain in root growth but little additional gain in shoot growth.

A third category of non-nutritive substances I've seen labeled "biostimulant" is microbes, nature's farmers. Thanks to new technology, microbes can be injected into the soil and have proven especially helpful in sand-based systems and other soils where they're deficient. Turf managers who've applied packaged microbes have seen fertilizer rates cut in half, longer roots and other "miracles."

At STMA's 1995 conference, Nick Spardy of the Wilbur-Ellis Company explained the five major functions of microbes. They:

- 1. Cycle Nutrients.** Microbes convert complex organic compounds into simpler forms that plants can feed on.
- 2. Structure Soil.** One waste product of bacteria is polysaccharides, which bind soil particles together, creating pores for the retention and movement of air, water and nutrients and the prevention of black layer.
- 3. Suppress disease and pathogenic fungi.** Bacteria do this three ways: antibiosis (production of antibiotics that kill pathogens), mycoparasitism (bacteria grow into fungi and feed on them till the fungi die), food competition (bacteria are more aggressive consumers of food in the environment, leaving many pathogenic agents to starve).
- 4. Stimulate Growth and Germination.** Bacteria and fungi produce a variety of plant-growth hormones, such as cytokinins and auxins, that trigger roots and stems to grow and seeds to germinate. Bacteria also colonize and protect seeds from plant pathogens till seeds germinate.
- 5. Convert Toxins into Nontoxins.** Microbes colonize roots and break down compounds toxic to a plant into simpler, nontoxic forms. For example, microbes buffer salts and keep them away from plants, resulting in minimum sodium uptake. Microbes also attack and reduce the levels of pesticides and other pollutants.

Under ideal circumstances, a turf manager can lay down a compost rich in microbes and let nature produce the cutting edge technologies grasses need. But sports turf managers rarely work under ideal circumstances, so hopefully the new human-made technologies can supply some relief.

J. Cooper

TIP O' THE MONTH

Testing Compatibility of Pesticides

Pesticide handlers often like to combine two or more pesticides and apply them simultaneously to save time, labor and fuel. If the pesticide label fails to tell you or you cannot find a chart that lists the compatibility of two pesticides (or the pesticide and other chemical) that you wish to mix, test a small amount of the mixture before you mix large quantities. Here's how.

First, put on personal protective equipment. Wear at least the equipment required by the labeling of any of the pesticides to be combined.

Second, get a large, clean, clear glass container, such as a quart jar. Use the same water (or other diluent) that you will use when making up the larger mixture. Add the water and each of the products in the same proportions as you will mix them. Unless the pesticide labeling states otherwise, add pesticides to the diluent (usually water) using the "W-A-L-E" plan:

1. Add some of the diluent first.
2. Add Wettable and other powders and Water-dispersible granules.
3. Agitate thoroughly and add the remaining diluent.
4. Add the Liquid products, such as solutions, surfactants and flowables.
5. Add Emulsifiable concentrates last.

Next, shake the jar vigorously. Feel the sides of the jar to determine if the mixture is giving off heat. If so, the mixture may be undergoing a chemical reaction and the pesticides should not be combined. Let the mixture stand for about 15 minutes and feel again for unusual heat.

If scum forms on the surface, if the mixture clumps, or if any solids settle to the bottom (except for wettable powders), the mixture probably is not compatible. Finally, if no signs of incompatibility appear, test the mixture on a small area of the surface where it is to be applied. □

The above tip comes from the book Applying Pesticides Correctly, published by the Environmental Programs Office, University of Nebraska.

STMA MESSAGE

The Ripple Effect



By: Bob Patt, STMA board member

Positive action can move through your organization in a wide-ranging ripple effect to produce results much greater than anticipated. This is what happened to Canton's Thurman Munson Memorial Stadium, which earned the Professional Diamond of the Year honors for 1995-1996, sponsored by STMA, Beam Clay and *sportsTURF*.

As a result, Kevan Lindsey (head groundskeeper), Bill Johnson (Canton's recreation director), John Reese (the recreation department staff member with responsibility for multiple recreation fields) and I (manager of Canton's Civic Center and Munson Stadium) attended STMA's 8th Annual Conference in Colorado Springs earlier this year.

There, we had the opportunity to observe activities and visit with several STMA board members. Once back in Canton, the four of us met to discuss joint actions we could take to benefit both the city and the recreation department. Together we purchased an aerator and a topdresser that both departments share. We cooperate in other areas as well.

Bill and John both gained a greater understanding of the importance of fields and the fact that better maintenance allows greater field use.

As a direct result of the conference, the recreation department's summer playground program now offers "A Day at Munson Stadium." Activities include an opportunity for

the youngsters to meet Kevan and learn how he paints designs, cuts the grass, and maintains the pitcher's mound and skinned areas of the infield. They're impressed with the care involved and take a certain "ownership" in the recreation department fields as a result.

Our award-winning field also is appreciated by Joe Scrivner, the general manager of our Frontier League professional team, the Canton Crocodiles. Joe notes he doesn't need to monitor the field to ensure decent playing conditions for his team. Kevan is on-site each day, and his knowledge and dedication produce a field that provides excellent playing conditions.

Players, coaches and owners of other teams in the league have set our field as their standard of excellence. Several have sought my advice on field construction and Kevan's advice on field maintenance. The league's commissioner has sent prospective franchises to observe the field so they know what can be done and why it matters.

In Minor League baseball, the game is part of the overall experience, and family attendance is increased by special events. So, the field is a marketing tool for the Canton Crocodiles.

Joe and Bill have established a program that connects Little League athletes with the professional players at each home game. As a pro is called to take the field, he is accompanied to his position by one of the Little League players. Because the field is in such great condition and the Crocodiles obviously take pride in it, the young players, coaches and parents are thrilled with the experience and better understand the role of the field in the game.

Obviously, our ripple of multiple-staff conference attendance produced a wave of positive results. We're planning now for the 1998 conference. □

New Turf Problem Solvers

- ◆ Reduced turf clippings
- ◆ Aggressive tillering & fill in
- ◆ Improved mowing quality
- ◆ Very dark green color
- ◆ Better versus brown patch
- ◆ Durable under traffic
- ◆ Establishes new performance standards

WIZARD
Turf Type Perennial Ryegrass



EXCEL
TURF TYPE PERENNIAL RYEGRASS



PENNANT II
TURF TYPE PERENNIAL RYEGRASS

CELEBRATION
DWARF PERENNIAL RYEGRASS BLEND



"Seeds for the 21st Century"
Burlingham Seeds

E. F. Burlingham & Sons
P.O. Box 217
Forest Grove, Oregon 97116
800-221-7333 503-357-2141
Fax 503-359-9223
Quality Seed since 1914

Training Yourself and Your Crews to the Top of the Field

Dr. Gil Landry

Your job is more than a master "To Do" list of things to accomplish on a daily, weekly, and monthly schedule. Just as you try new fertilizers and herbicides, retrofit an existing irrigation system, or expand the memory of your computer, you need to upgrade your own capabilities and those of your teammates. Reaching the top of your field — as a manager, crew leader or worker — means constantly improving through education and training.

Yes, there are reasonable excuses. The daily demands are too great. You don't have time. Yet, in the reality of today's rapidly changing world, you can't afford not to keep learning.

Where do you want to be professionally next year, or ten years from now? What must you do to get there? Explore the opportunities.

Education

Education could include going back to college to complete your undergraduate degree or move up to an advanced degree. Formal education creates greater career opportunities. Many positions in sports turf management

now require a technical school or college degree. Try to identify your weakest area and take steps to strengthen yourself.

Strengthen your weak areas or raise your overall knowledge level through specific courses, taken in the classroom or through correspondence. Do you know as much about the behavior of soils as you should? Maybe you need a communications course to improve your writing or speaking skills to handle the public relations aspect of your job, an accounting course to help you prepare your annual budget, or a computer course to assist in your record-keeping responsibilities.

The discipline of structured learning may be as important to your future as the information you acquire. Knowing where and how to find information and how to process it never becomes outdated.

Another important career step is acquiring the education and training necessary to complete a certification program. This might include studying the manual and working with your supervisor or equipment-supplier rep-

resentatives to prepare for pesticide applicator certification. It might entail reviewing the preliminary aspects of the Sports Turf Managers Association's certification program currently in the developmental stages, or talking with one of the Certification Committee members, to determine some of the steps you can begin now to work toward achieving certification.

Take advantage of career-specific educational opportunities. Review the programs of STMA's annual conference, your regional turfgrass conference and your STMA chapter meetings.

Take as many staff members to these programs as your budget will allow. Interaction among peers is a major learning tool of industry-specific conferences, meetings, and field days. Encourage your staff members to renew old acquaintances and meet new people at these events, and do so yourself.

Talk with the speakers. Introduce yourself to another attendee who asked a question or made a comment that pertained to your own job situation. Ask for input on current problems



Members of the Iowa STMA meet for hands-on demonstrations and up-close viewing of field conditions at Muscatine Soccer Complex, winner of the 1996 Soccer Field of the Year Award.

or pending decisions. Exchange cards for later follow-up by phone, fax or e-mail. Information shared during this informal discussion with your peers often pays for the entire cost of the trip.

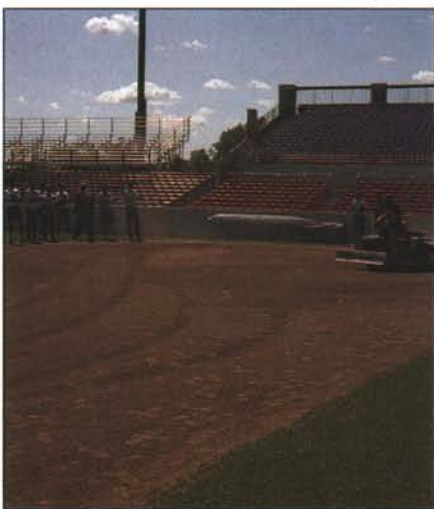
Make the most of each event's program. Squeeze in a few minutes before these events to jot down important questions you'd like to have answered in these sessions. When multiple sessions are offered during the same time period on a conference program, determine which personnel will attend which sessions.

Be an active participant in round-table discussions. Direct staff members to summarize presentations in an informal staff meeting and discuss how that information might impact your situation.

Read! Read all the industry-related information you can in books, magazines and newsletters. Be prepared to make use of those extra minutes scattered throughout each day. Keep a file on your desk, and a folder in your car or truck, of articles you want to read. Set up an "idea" file in which you can place items for later review. Scan the Internet while phone tag puts you on hold.

Training

There's always a way to do it faster, do it better, do it more efficiently. It's



Iowa STMA members learn the various elements of baseball field maintenance at Sec Taylor Stadium, home of the AAA Iowa Cubs.

your job to find out how.

Take part in the demonstrations and hands-on learning sessions of conferences and meetings. There will be a group intent on learning more. Join them. Get involved in the flow of questions and answers. See how others handle a specific task and find out why they do some elements of it in ways different from the steps you use. Take the risk of operating a machine or tackling a procedure in front of the group, and ask to be critiqued on your performance.

Study training manuals and videos, not only before undertaking a new procedure, but as a review to improve your current performance of a familiar task.

Take advantage of supplier training programs on equipment, irrigation systems, computers and new products. Don't be afraid to ask questions. Take notes. Find out why specific changes have been made in equipment and products and what those changes should mean on the job. If you've had a problem with a piece of equipment or a product in the past, explain it to the training personnel, find out if others have experienced the same problem and, if so, what they did to overcome it. Share your wish list of the features you'd like to see introduced and why you think they would be beneficial.

Check out seed test plots and university research plots. Talk with those running the testing and those handling the day-to-day maintenance. Discuss the techniques being used, the inputs that are controlled and the variable conditions. Ask about the results they are getting and how those match or vary from the results they expected. Seek their explanations of the results and any unexpected elements of the testing.

Visit other facilities. Observe all you can. Ask questions during your tour of the fields, shops and office. If you have information that could be helpful, share it. Establish on-going relationships with those in positions similar to your own with idea and information sharing the goal.

Bring your boss along as often as possible. The more he or she knows about your job, the easier it should be to enlist support.

Obviously, experience is a great



STMA's Annual Conference and Exhibition is a mix of classroom-style presentations, panel discussions, round-table discussions, demonstrations and trade show all blended with the opportunity to meet and discuss important issues with peers.

teacher, and often you can learn very effectively by conducting your own research. For example, if you are trying to solve a problem by using some product or cultural practice, leave a small untreated "check" to compare. If you are putting out a granular fertilizer or spraying a product, drop a two-foot square of non-porous material on the ground to exclude the product. Track the results. If you don't see a response above or below the soil surface, was the treatment needed?

There are many ways to get started in this learning process, but you need to start today. In addition to the above ideas, a good resource might be the *Turfgrass Management Information Directory*, from Ann Arbor Press Inc., P.O. Box 310, Chelsea, MI 48118.

Sports turf management is a vital, challenging, growing, changing industry. Take the steps you need to insure you will be a valuable part of it. □

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.



Hot Time in Minnesota



Dick Ericson, whose career began in 1948 as assistant groundskeeper for the Saints, throws out the first ball after receiving his STMA Honorary Life Membership at a Saints game. Photos courtesy: Trusty & Associates.

Over 50 members and guests of the Minnesota Chapter boarded a bus at Midway Stadium in St. Paul on the hot 16th day of July for the 3rd Annual Workshop on Wheels. The first stop was McMurray Park, where four vendors were set up to demonstrate various pieces of aerification equipment. Attenders could observe options in action to help determine what might work in their own situations.

The next stop was the Indoor Sports Training Center at Rice & Arlington Sports Dome, a facility with 100,000 square feet of artificial turf under a dome. Although the original plan was for the dome to be up only from late fall until early spring, it was still up during the tour, and there is speculation it will remain up. The tour was conducted by VP of Inside Sports Steve Winfield (yes, Dave's brother). The facility is used year round for both slow and fast pitch softball, Little League baseball, and soccer. There was an excellent interchange of information between Winfield and members who have artificial surfaces. It was another example of how both attenders and hosts of an STMA event can benefit. The complex is owned by the city and managed by private enterprise. It opened the end of February and has experienced extensive use.

The third stop was the City of Plymouth Athletic Facility, a joint venture between Life Time Fitness, the

City of Plymouth and the Wyzata School District. The \$22 million facility exemplifies what can be accomplished when various entities work together. All reports indicate this is a win-win-win situation. The facility includes indoor and outdoor pools, weight rooms, basketball courts, rock climbing, exercise rooms, locker rooms, hockey and skating rinks, health and beauty rooms, and much more. Many STMA members manage more than athletic turf, and this stop focused on some of the things that concern them.

The next stop included an informative tour of the Turfco Manufacturing plant, where the visitors saw raw materials arriving through one door, finished goods leaving another, and all the steps in between. Several quality checks were pointed out, and it was fascinating to observe the modern robotics used in some of the manufacturing steps. Turfco also provided a picnic lunch on their turfed test area.

The National Sports Center in Blaine, Minn., was the fifth stop. This state-owned facility, with 55 fields, is reportedly the largest soccer complex in the world. There is no turf professional on staff: all work is contracted with outside sources. Agronomist Mike Kelly from the Glenn Rehbein Co. pointed out several of the experimental technologies the complex incorporates. Part of the area was seeded five weeks

before the tour and was under an inch of water two days before. Those in attendance observed some excellent playing conditions along with some areas that showed the stress.

An inner-city soccer field was the next stop. Corporate and private donations headed by Honeywell and one of its retired executives made this outstanding field possible. Washed sod was laid ten days before the stop. The Minnesota Chapter of STMA has committed to helping maintain the field with volunteers from the area. A trio of youngsters from a nearby apartment were already watching over "their field" and wanted to make sure the crowd didn't hurt it.

Bethel College's athletic fields were the seventh stop. The main field was used for football last fall after washed sod was installed in July. Many questions about the field's care were answered.

The bus buzzed with discussion between stops. Topics included irrigation, striping, fertilization and mowing practices.

The last stop of the day included a relaxing tailgate party at Midway Stadium and the St. Paul Saints evening game. Besides seeing an excellent playing field and watching a baseball game, the full house got to witness STMA's first president, Dick Ericson, receive his Honorary Life Member cer-

continued on page 13