



2010 STMA STUDENT CHALLENGE STUDY GUIDE

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JANUARY 15, 2010
LAKE BUENA VISTA, FL

Introduction

The STMA Student Challenge will consist of several parts. Included will be physical and visual identification of samples, some hands-on evaluation and evaluation of equipment (e.g. reel to bedknife adjustment), multiple choice, fill-in-the-blank, and matching questions. There will be between 100 and 150 questions and 1 case study question, which will be derived from the two scenarios presented in this study guide.

Remember to budget your time accordingly, so that you can complete the entire exam including the Case Study. You will be provided with scratch paper, an answer booklet, pencils, calculators, and a blue book. You are expected to be in business casual attire for the exam, so no hats will be allowed in the exam room. Also, please leave any backpacks in your room as you will not be allowed access to them during the exam.

Please remember notes and resources will NOT be allowed in the exam room. You may however, want to refer to the textbooks listed in the Study Resources section of this guide during your preparation. You may also wish to speak to your instructors, peers, and/or other industry professionals regarding topics in the general study guide and case studies. Start networking now! The STMA directory is available online to all student members and is full of quality industry professionals.

The deadline to register for the STMA Student Challenge is December 18, 2009.

BECAUSE STUDENT CHALLENGE PARTICIPANTS' REGISTRATION FEE IS WAIVED, STUDENTS MAY NOT REGISTER ONLINE. Each participant must fill out a physical form and fax or mail it back to STMA. Please contact STMA with any questions at 800.323.3875.

Rules and Guidelines for the STMA Student Challenge

- 1. Teams shall consist of no more than four members from two year undergraduate, four year undergraduate, technical school, or junior college programs**
 - ◆ Undergraduate individuals are allowed to compete as an individual if they choose
 - ◆ Team members graduating up to three months prior to the date of the STMA Student Challenge are allowed to compete, so long as they have not begun a graduate program
- 2. Prior to competing teams must declare whether they will compete in the two year or four year competition**
 - ◆ Teams with any members who are in a four year program must compete in the four year competition
 - ◆ Example 1: One team member from four year program at University X, three team members two year program at University X. Team must compete in four year competition.
 - ◆ Example 2: One team member from four year program at University Y, three team members two year program at Junior College Z. Team must compete in four year competition.
- 3. Graduate students are not eligible to compete in the STMA Student Challenge, take the Student Challenge exam, or enter the exam room**
- 4. Individuals from different institutions can form teams to compete, but are not required to be on a team and may compete as an individual**
 - ◆ Awards and prizes will be divided according to the breakdown of schools represented on the team
 - ◆ Example: Two team members from University X, one team member from College Y, one team member from Junior College Z
 - ◆ 50% of prize to University X, 25% of prize to College Y, 25% of prize to Junior College Z
- 5. Should two schools have the same score, and that score qualifies for first, second, or third place, the following tiebreakers will be applied**
 - ◆ The team with the higher case-study score wins
 - ◆ Three exam questions, as determined by the Student Challenge Committee prior to each year's competition
 - ◆ Example: In year XXXX, Questions #31,# 41,# 51 are tiebreakers
 - ◆ Team A gets #31 correct, Team B gets #31 correct
 - ◆ Team A gets #41 correct, Team B gets #41 correct
 - ◆ Team A gets #51 incorrect, Team B gets #51 correct
 - ◆ Team B is declared winner

6. Two year competition prizes

First Place

- ◆ A cash award, equal to that presented to the Four Year Competition First Place Team, presented by The SAFE Foundation
- ◆ A plaque recognizing the team as STMA Student Challenge Champions, Two Year Competition
- ◆ One medallion per team member and one medallion for the school

Second Place

- ◆ A plaque recognizing the team as STMA Student Challenge Second Place, Two Year Competition
- ◆ One medallion per team member and one medallion for the school

Third Place

- ◆ A plaque recognizing the team as STMA Student Challenge Third Place, Two Year Competition
- ◆ One medallion per team member and one medallion for the school

7. Four year competition prizes

First Place

- ◆ A cash award, equal to that presented to the Four Year Competition First Place Team, presented by The SAFE Foundation
- ◆ A plaque recognizing the team as STMA Student Challenge Champions, Four Year Competition
- ◆ One medallion per team member and one medallion for the school

Second Place

- ◆ A plaque recognizing the team as STMA Student Challenge Second Place, Four Year Competition
- ◆ One medallion per team member and one medallion for the school

Third Place

- ◆ A plaque recognizing the team as STMA Student Challenge Third Place, Four Year Competition
- ◆ One medallion per team member and one medallion for the school

8. First place winners receiving prize money in the Two Year and Four Year competitions shall have the following obligations to STMA

- ◆ A professional presentation or poster session at the STMA Conference
- ◆ Give one (1) student education track presentation from the winning team's students or advisor or from someone familiar with the school's project
 - ◆ If the winning team members consist of all seniors, then the school's advisor or someone familiar with the project shall present
 - ◆ If travel to the conference to make the presentation is not possible, a poster display will be required.
- ◆ Advisors wishing to make an additional presentation must follow the protocol for presentations set by the STMA Conference Education Committee
- ◆ Author an article to be used in *SportsTurf* magazine, STMA Chapter Newsletter, STMA Online Newsletter, or any other STMA communication vehicle.
- ◆ Each winning team shall file a short, written progress report to the Student Challenge Sub-Committee Chairperson.

9. Preferred uses of SAFE First Place Funds

- ◆ To create an Athletic Sports Field learning lab
 - ◆ *Ex:* build home plate/mound; small-scale field for painting, drainage, irrigation, mowing; infield, synthetic field, soccer and lacrosse goal areas, etc.
- ◆ Purchase Athletic Sports Field Specific Equipment and Products
 - ◆ *Ex:* paint sprayers, transits, hand tools, mowers, irrigation equipment, tarps, stencils, paint, soil conditioners, clay, etc.
- ◆ Other items or projects as approved by the STMA Student Challenge Chairperson or Committee
- ◆ It is The SAFE Foundation's policy to not pay overhead costs at the winning team's university, college or school. Funding is not intended for field days. Funds need to be spent or designated to be spent prior to the next year's STMA annual conference. Winning teams are encouraged to leverage the prize to generate additional funding through collaboration with campus athletics, the community, or other organizations.

10. STMA Student Challenge day of testing policies and exam room protocol

- ◆ You will have 2 ½ hours to complete the exam from when the head proctor begins the test
 - ◆ There is a Multiple Choice section and an Identification section, which will be answered in the Answer Booklet
 - ◆ Fill in the bubble of the most correct answer in the Answer Booklet. Graphics, calculations, and conversions found on pages 16 and 17 of the Test Booklet are referred to in several questions.
- ◆ The Case Study is at the end of the Test Booklet and will be answered in a Blue Book (provided).
- ◆ Only use the answer materials, pencils, and calculators provided.
- ◆ No hats, book bags, books, notes, outside calculators, or cell phones will be allowed in the testing area.
- ◆ CSFM Monitors will be located throughout the room to answer questions.
- ◆ Teams will be directed by the CSFM Monitors when to view the turf identification, insects, weeds, and diseases.
- ◆ Please write FINAL at the top of the Answer Booklet and your Blue Book. Insert the Answer Booklet and Test Booklet inside the front page of Blue Book and return all materials, including scratch paper, calculators, and pencils to CSFM Monitors at the front of the room. Everything must be returned in the testing packet.
- ◆ **TESTING MATERIALS MAY NOT BE REMOVED FROM THE ROOM.**
 - ◆ Failure to comply by turning in your test constitutes academic fraud and your team and school will be banned from competing in the STMA Student Challenge for a period to be determined by the STMA Student Challenge Committee.
- ◆ After finishing the exam, please wait outside the exam room to have your team's picture taken.
- ◆ Winners and team scores will be posted as soon as possible near the STMA registration desk. Scores will also be posted outside of the Awards Banquet this evening.

Topics Covered in the STMA Student Challenge

The section topics have been based upon the STMA competency outlines and are as follows.

Turfgrass Identification, Selection, and Morphology

- Identify major turfgrass species by differentiating the morphological characteristics (using live samples).
- Identify the regional climatic zones of the U.S. and which turfgrass species are best adapted to those zones.
- Understand the basics of the selection of turfgrasses for sports field use based on the adaptability of the turfgrass species and cultivars in various agronomic and climatic conditions.
- Understand the principles of the formulations of blends and/or mixtures of turf grasses.
- Understand the different seeding techniques and be able to choose the proper one for various conditions.
- Understand vegetative turfgrass establishment via sprigs, stolons and sod and the various techniques used in each.

Turfgrass Soils

- Identify basic soil types using the soil textural triangle.
- Understand soil formation, soil profiles and soil classifications as they relate to sports field management.
- Understand soil physical properties, i.e. texture, structure, aggregation, bulk density, porosity, drainage, water relationships and modification.
- Understand soil chemical properties, i.e. soil acidity/alkalinity, cation exchange capacity, salt concentrations, phytotoxic contaminants and nutrient availability.
- Understand the physical, chemical and biological characteristics of soils and their influence on turf grass growth.

Soil Fertility

- Understand the fertilizer label and its components.
- Be able to calculate the nutrients applied on an elemental basis for a given area and rate.

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- Understand turfgrass nutrition requirements and the effects of excesses, deficiencies and nutrient imbalance on turfgrass growth.
 - Know the mineral elements essential for turfgrass growth, their sources, and their relative requirements by species (macronutrients, secondary, and micronutrients).
 - Know the differences in the physical characteristics of fertilizers and how these differences can influence the uniformity of size and their dispersion tendencies.
 - Understand the differences in the release characteristics of fertilizers and when the best time is to apply the different types.

Water Management

- Understand the basics of irrigation system hydraulics and precipitation rates.
- Understand evapotranspiration (ET) and the factors which influence it.
- Understand the importance of proper irrigation system design to achieve efficient and uniform distribution of water.
- Understand the importance and necessity of water quality and water conservation.

Drainage

- Understand how the dispersion test can help a turf manager evaluate the stability of a soil.
- Understand the forces that influence surface tension of water and how these forces influence water intake, movement and retention in soils.
- Understand the forces that are required to pull water through the soil; e.g. suction or matric potential.
- Recognize the differences among saturation, field capacity, wilting point and permanent wilting point.
- Have a working knowledge of the reasons for a field experiencing net infiltration, ponding, or runoff.
- Understand the reasons for localized dry spots (LDS) and how to manage those areas.
- Understand the concept of the perched water table and its use in sports fields.
- Understand the design criteria for a subsurface drainage system which includes: drainage patterns, pipe size, slope, and collector drains.
- Be able to identify the different types of drainage pipe and related equipment.

Turfgrass Mathematics

- Perform area calculations for geometric configurations used in sports fields.
- Calculate conversions between metric and English measurement systems given the formulas.
- Calculate application rates for a given area.
- Calculate application rates in pounds or ounces of active ingredient (a.i.) or of product per unit area.
- Perform volume calculations for topdressing materials, skinned area clay mixes or other products used in sports field management.
- Calibrate liquid and dry material application equipment.
- Calculate precipitation rates and water related problems

Pest Management

- Understand climatic conditions and management practices, which may influence various pest infestations.
- Have a basic understanding of pesticide activity, i.e. contact versus systemic, preventative versus curative.
- Identify the various pesticide physical formulations such as emulsifiable concentrate, flowable, water-soluble packet, granular, etc.
- Knowledge of label restrictions, material handling, and safety.
- Knowledge of distribution equipment including sprayer setup, pressures, nozzles, and pumps; broadcast and drop spreaders.
- Knowledge of integrated pest management techniques in the overall sports field management plan.
- Knowledge of environmental concerns such as drift, runoff, leaching, and persistence.
- Identify weeds (grasses, sedges and broadleaves) and understand their growth cycles in both cool season and warm season grasses (using live samples).
- Identify major turfgrass insect pests, understand their life cycles, and diagnose resulting turfgrass damage of both warm season and cool season turfgrasses (using specimens).
- Identify the major turfgrass diseases, understand their life cycles, and diagnose resulting turf grass damage of warm season and cool season turfgrasses (using photos).

Sports Field Management – Turf Areas

- Understand general concepts dealing with safety, i.e. smoothness, consistency, uniformity, on and off field hazards (may include safety checklist knowledge).
- Understand basic concepts of playability – traction, surface stability, species selection, irrigation management, appropriate crown specifications.
- Comprehend basic Cultural Practices
 - Knowledge of appropriate heights of cut and directional mowing, reel vs. rotary mower
 - Identify and adjust a reel mower's height of cut and evaluate reel to bedknife clearance
 - Understand soil compaction causes, effects on the physical properties of soils and effects on turfgrass growth.
 - Know the different methods and techniques of cultivation, including the types of equipment and techniques used and the advantages and disadvantages of each.

Sports Field Management – Non Turf Areas

In this section, knowledge of management and maintenance of non-turf areas will be evaluated. Topics will include:

- Identify the different types of soil conditioners and how they are best used on sports fields.
- Basic pitcher's mound construction and maintenance.
- Surveyor's transit use: Measure heights using a transit and determine correct height of pitchers mound and its slope.
- Skinned area construction and maintenance
 - Lip prevention and maintenance
- General knowledge of synthetic turf characteristics and maintenance

Study Resources

The following textbooks, along with STMA's monthly publication, *SportsTurf* are recommended as study resources. The textbooks may be available through your school library, local bookstore or may be purchased online from various book outlets.

- 1) **The Mathematics of Turfgrass Maintenance** (*Third Edition*) – Michael Agnew and Nick Christians
- 2) **Sports Fields** – Jim Puhalla, Jeff Krans, and Mike Goatley
- 3) **Fundamentals of Turfgrass Management** (*First or Second Edition*) – Nick Christians
- 4) **Turfgrass Management** (*Fifth or Sixth Edition*) – A.J. Turgeon
- 5) **Turfgrass Soil Fertility and Chemical Problems** – R.N. Carrow, D.V. Waddington, and Rieke
- 6) **Managing Turfgrass Pests** – Thomas L. Watschke, Peter H. Dernoden and David J. Shetlar
- 7) **Controlling Turfgrass Pests** (*2nd Edition*) – Thomas W. Fermanian, Malcom C. Shurtleff, Roscoe Randell, Henry T. Wilkinson and Philip L. Nixon
- 8) **Destructive Turfgrass Insects** – Daniel A. Potter
- 9) **Precipitation Rates and Sprinkler Irrigation and Irrigation Hydraulics** – Hunter Industries
- 10) **Practical Drainage for Golf, Sportsturf, and Horticulture** – Keith McIntyre and Bent Jakobsen.
- 11) **Establishing and Maintaining the Natural Turf Athletic Field**—Stephen T. Cockerham, Victor A. Gibeault, and Deborah B. Silva

Study Resources (continued)

The following advisory bulletins can be found on the STMA website at www.stma.org. Videos can be ordered from the same website.

- 12) A Guide to Synthetic and Natural Turfgrass for Sports Fields** - STMA Advisory Bulletin
- 13) Determining the Right Sports Field for Your Athletes** - STMA Advisory Bulletin Number 1.
- 14) Suggested Equipment List** - STMA Advisory Bulletin Number 2
- 15) In-House; Architect-Bid Contractor; Design-Build; Owner's Representative... What works best for building your sports field?** - STMA Advisory Bulletin Number 3.
- 16) The Fundamentals of Project Management** - STMA Advisory Bulletin Number 4
- 17) Baseball Mound Reconstruction: A Professional Approach** - STMA Video

The following websites may be helpful in preparing for the exam.

- 17) www.agry.purdue.edu/turf/tool/index.html**
- 18) buckeyeturf.osu.edu/pdf/01_turfgrass_identification.pdf**

Weed List for STMA Collegiate Student Challenge

Algae	Dandelion	Puncture Vine
Annual bluegrass	Downy Brome	Purslane
Annual Sedge	English Daisy	Quackgrass
Barnyardgrass	Field Bindweed	Red Sorrel
Bedstraw/Catchweed	Geranium	Sandbur
Bermudagrass	Goosegrass	Shepherd's Purse
Black Medic	Green Foxtail	Speedwell
Boradleaf Plantain	Ground Ivy	Spotted Spurge
Broadleaf plantain	Hawkweed	Star of Bethlehem
Buckhorn Plantain	Kikuyugrass	Venice Mallow
Bull Thistle	Kochia	Virginia Buttonweed
Bull thistle	Henbit	Western Salsify
Carpetweed	Lambsquarter	White clover
Chicory	Moss	Wild Carrot
Common Chickweed	Mouseear Chickweed	Wild Garlic
Common Mallow	Musk Thistle	Wild Strawberry
Common Mullein	Nimblewill	Wild Violet
Crabgrass	Orchardgrass	Yarrow
Creeping Woodsorrel	Pennywort	Yellow Foxtail
Curly Dock	Peppergrass	Yellow Nutsedge
Dallisgrass	Pineapple Weed	Yellow Woodsorrel
	Prickly Lettuce	
	Prostrate Knotweed	
	Prostrate Spurge	

Accepted Names - Grasses

Common Name	Latin Name
Creeping Bentgrass	<i>Agrostis palustris</i> (<i>A. stolonifera</i>)
Colonial Bentgrass	<i>Agrostis capillaris</i>
Tall Fescue	<i>Festuca arundinacea</i> (<i>Lolium arundinaceum</i>)
Creeping Red Fescue	<i>Festuca rubra</i>
Hard Fescue	<i>Festuca trachyphylla</i> (<i>Festuca brevipila</i>)
Kentucky Bluegrass	<i>Poa pratensis</i>
Supina Bluegrass	<i>Poa supina</i>
Annual Bluegrass	<i>Poa annua</i>
Rough Bluegrass	<i>Poa trivialis</i>
Italian Ryegrass/ Annual Ryegrass	<i>Lolium multiflorum</i>
Perennial Ryegrass	<i>Lolium perenne</i>
Smooth Brome	<i>Bromus inermis</i>
Buffalograss	<i>Buchloe dactyloides</i>
Bermudagrass	<i>Cynodon dactylon</i> var. <i>dactylon</i>
Hybrid bermudagrass	<i>Cynodon dactylon</i> x <i>C. tranvaalensis</i>
Bahiagrass	<i>Paspalum notatum</i>
Kikuyugrass	<i>Pennisetum clandestinum</i>
St. Augustine grass	<i>Stenotaphrum secundatum</i>
Japanese Lawngrass (<i>Zoysiagrass</i>)	<i>Zoysia japonica</i>
Seashore Paspalum	<i>Paspalum vaginatum</i>
Carpetgrass	<i>Axonopus affinis</i>
Centipedegrass	<i>Eremochloa ophiuroides</i>

Student Challenge Case Studies

Preparation prior to your arrival at the exam date will be important for the entire student challenge and critical for the case study portion of the exam. The actual case study question, or line of questions, on the student challenge exam will be derived from one of the following case studies.

It will be a specific question or line of questioning about the case study site. You will need to be prepared to answer questions based on BOTH case studies. This means students studying at a cool season University will need to study warm season grasses and vice versa. Case study questions may include any topic that is covered in this Student Challenge Study Guide.

On the exam day, you will not be allowed any notes. You will have approximately 30 minutes to arrive at your answer to the question(s) provided and hand write an essay response. Written calculations may be required for the case study. Calculators, bluebooks, pencils, and scratch paper will be provided.

CASE STUDY SCENARIO ONE

OHIO MINOR LEAGUE/UNIVERSITY BASEBALL FIELD

You are the Sports Turf Manager for a short season Minor League Baseball team in eastern Ohio. The stadium you work in is owned by a local university whose baseball team also uses the facility. The Minor League team is a financially solid franchise with a strong fan base. Your organization provides you with the monetary backing and cooperation you require. University personnel have also proven to be supportive. You and your organization have high standards for the playing field. You report to the Minor League team's General Manager but you have a dual responsibility to ensure a quality playing surface for both the minor league and college teams. An additional part of your job is to act as a liaison between the university and the professional team.

You are responsible for the care of the playing surface year round. There are also some small landscaped areas surrounding the stadium that you maintain. The playing surface is 110,000 sq. ft. of Kentucky bluegrass. The root zone is a modified silt loam. A drainage system was installed that consists of two inch pipe on ten foot centers connected to a perimeter drain pipe. The two inch pipe trench was backfilled with sand. Sand slits were then installed at a ninety degree angle, every two feet. Sod was then laid on top. The drainage system has never worked as expected. The field is irrigated, but full coverage has been a problem. The grade has always been a little off, especially around the infield arc. The turf has done well overall but has always had significant dry spots. The heavy traffic areas have needed to be re-sod on multiple occasions.

Your biggest challenge has been the heavy schedule, especially during Ohio's early spring. The college baseball team begins using the field in early March. Professional baseball then starts in mid to late June, followed by college fall baseball. The field is also used for many camps and special events. Your field sees over 150 events in an eight month period. The only time of inactivity is the winter.

Budget:

Fertilizer and Pesticides	\$10,000
Labor	\$13,000
Sport Turf Manager	(not incl.)
Asst. Sport Turf manager (year round)	(not incl.)
1 Sports Turf Intern (june-aug)	\$1000/month
3 Game day employees (june-sept 10)	\$30/game
Other operating expenses	\$20,000

Owned equipment:

- One (1) Tractor with bucket, new
- One (1) triplex mower, fair condition
- One (1) utility vehicle, fair condition
- One (1) designated spraying unit, poor condition
- One (1) infield groomer, fair condition
- One (1) top dresser, good condition
- One (1) core harvester, good condition
- One (1) pull behind (3pt hitch) core aerator/slicer
- One (1) rotary walk behind spreader
- All hand tools, drags, hoses, etc. in fair to good condition

Tarp: 175' x 175' full infield tarp in good condition

Soil Tests: (very low, low, moderate, optimum, very high)

Soil pH-	7.2
Soil type-	silt loam
Potassium-	high
Phosphorus-	high
Calcium-	low
Magnesium-	low
Sodium-	very low
CEC-	6.2

Disease history: Fairy ring, leaf spot.

Insect/Vertebrate history: Grubs are present and have been treated.
Voles were exterminated and have not returned.

Weed history: Have not been a problem. Poa annua has appeared but has been kept in check thus far.

CASE STUDY SCENARIO TWO

HIGH SCHOOL FOOTBALL COMPLEX

You are a high school Sports Turf Manager in the upstate of South Carolina. Football is king in this area and you are in charge of a stadium field and a practice field.

The 419 Bermuda football practice field is used approximately 150 days a year. The practice field is approximately 64,000 sq. ft. Summer workouts begin the first week of June. The team practices three days a week until the start of school in late August. Once the season starts, the team practices Monday through Wednesday. Thursday's practice is on the game field.

The game field is also 419 Bermuda. There will be five regular season home games as well as two "B" team games. The marching band of 50-60 members is allowed to practice on the game field on Friday afternoon only. The game field has a two percent grade from the center line of the field. The native soil is a sandy clay loam. Catch basins around the perimeter of the field remove surface drainage. The entire turf area including the playing field, sidelines and back of end zones is approximately 83,560 square feet.

The Bermuda is overseeded each fall with perennial rye. This season, the temperatures in early May were very cold for this part of the country. This stunted the bermuda grass coming out of dormancy and generally disrupted the transition. As the temperatures increased going into June, the precipitation decreased. The upstate of South Carolina began a period of extreme drought with increasing temperatures. Summer showers provided temporary relief through July, while August was very dry.

Both fields have automated irrigation systems that provide good coverage. The school is on city water supply. The first of August the local city water department informed the school you will be under water restrictions until the drought is over. Overseeding is scheduled for October. You have also been informed that the field will start hosting high school soccer games next spring.

Budget (both fields)

Fertilizers and herbicides	\$10,000
Labor	\$60,000
Sports Turf Manager	salary
Asst.	salary
Equipment Maintenance	\$2,000
Operating expenses	\$12,000

Equipment Owned: (Located at High School)

- * Turfco Meter Matic III topdressers- good condition.
- * One John Deer 4x6 Gator- good condition.
- * One Jacobsen Tri King- good condition.
- * One Ryan Tracaire Aerator/Verticutter- Excellent condition.
- * 60 Gallon Broyhill spray rig –good condition.
- * Two string weed eaters- good condition

- * One Vicon pendulum fertilizer spreader- Good condition.
- * One Ryan 12” walk behind sod cutter- Excellent condition.
- * One John Deere 5205 Tractor with front-end loader.Excellent condition.
- * Standard turf tools and hand tools, etc. Good to fair condition.
- * Painters and templates- Good condition.

SOIL TESTS RESULTS:

Game field ph: 6.6	Practice field ph: 6.3
Soil type: Sandy Clay Loam	Soil Type: Sandy Loam
Phosphorus: Very High	Phosphorus: Medium
Potassium: Medium	Potassium: Medium
Magnesium: High	Magnesium: High
Calcium: High	Calcium: High
CEC: >9.0 cmolc kg	CEC: 4.6-9.0 cmolc kg

Disease History: Dollar spot in most years. Pythium and other summer disease have been occurring variably.

Insect History: Fall armyworm threat has increased last two years. No other major problems.

Weed History: Low to moderate crabgrass and dallisgrass on both fields. Some yellow nutsedge around goal-posts on game field. *Poa annua* is found on both fields, especially between the hashes on practice field.

END CASE SCENARIO TWO