



2021 Student Challenge Study Guide



Presented in partnership with the SAFE Foundation,
Founding Partner Hunter Industries, and Ewing

SAFE

The Foundation for Safer Athletic Fields

Hunter[®]
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Introduction

Thank you for your participation in the 2021 STMA Student Collegiate Challenge! The Student Challenge is presented in partnership with the SAFE Foundation, Founding Partner Hunter Industries, and supporting sponsor Ewing. Each year students from 2-year and 4-year colleges and universities across the country compete in an exam that challenges knowledge in the sports field industry.

The 2021 STMA Student Challenge is going virtual. The event will consist of two sections – an oral presentation and a virtual exam. The oral presentation will be available for completion between Sept. 1 – Nov. 25. The virtual exam will be available for completion between Dec. 1 – Jan. 8. See the Exam Overview for more information about what is required for each section.

Each team member is required to register online to participate in the 2021 STMA Student Challenge. You must provide your name, email, team member names and emails, institution name, if you are in a 2 year or 4 year program, and your advisor's name and email. Each student must register individually and be a current STMA member. If you are not a member, you must first become a student member. Once you are a member, the Student Challenge registration option will appear in the STMA Store. You will only see the Student Challenge registration option if you are a current member. Please contact STMA with any questions at 800-323-3875 or kalthouse@stma.org. Visit www.stma.org to register.

Important Deadlines:

Please be sure to thoroughly read the Exam Overview section. These dates indicate the final day for registration and submission.

Registration: November 18, 2020

Oral Presentation: November 25, 2020

Virtual Exam: January 8, 2020

STMA Student Challenge Participant Code of Conduct and Eligibility Requirements

IMPORTANT - READ THIS PAGE BEFORE PROCEEDING

Code of Conduct

As a participant in the STMA Student Challenge and a guest of STMA, SAFE, and the sponsors of the event, all participating students are expected to conduct themselves in a professional, courteous, and responsible manner.

Academic integrity is the pursuit of scholarly activity free from fraud and deception. Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabricating of information or citations, or facilitating acts of academic dishonesty by others. STMA takes violations of academic integrity very seriously. You are expected to uphold the standards of academic integrity for the duration of the Student Challenge. Should a student be deemed to be in violation by authorized STMA staff or volunteers, the team/school that the student represents may be disqualified from current and future STMA Student Challenge competitions and forfeit all awards.

Eligibility

Graduate students are not eligible to compete in the STMA Student Challenge or take the Student Challenge exam.

Participants in the STMA Student Challenge competing on a two-year team may compete in no more than three total Student Challenge events. Participants in the STMA Student Challenge competing on a four-year team may compete in no more than five total Student Challenge events. Students who have transferred from a two-year program to a four-year program may compete in up to five total Student Challenge events.

Should a student be deemed to be in violation of any of these policies by authorized STMA staff or volunteers, the team/school that the student represents may be disqualified from current and future STMA Student Challenge competitions and forfeit all awards.

Please contact STMA with any questions regarding these policies at 800-323-3875 or kalthouse@stma.org.

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 can 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 from 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 from 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 or take the Student Challenge exam.

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. Grading Protocol:

- Oral Presentation
 - A team of Student Challenge Committee members will be grading the oral presentations from Dec. 1 – Jan. 8.
 - A team score will be applied to the oral presentation.
- Virtual Exam
 - Results will be automatically generated.
 - Students will earn an individual score that will be combined for an average team score.
- Final team score will be a combination of the virtual exam and oral presentation.
- Final event results will be released Thursday, January 14, 2021.

6. Should two schools have the same score, and that score qualifies for first, second, or third place, the following tiebreakers will be applied

- In the event of a tie, the team who has the higher score on two-out-of-three sections of the exam shall be declared the winner or finish higher.
- If the above procedure does not resolve the tie, the team with the higher score in the Oral Presentation shall be declared the winner or finish higher.
- If the above procedure does not resolve the tie, the team with the higher score in the Identification section shall be declared the winner or finish higher.
- If the above procedure does not resolve the tie, the team with the higher score in the Multiple Choice section shall be declared the winner or finish higher.

7. 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 trophy recognizing the team as STMA Student Challenge Champions, Two-Year Competition
- One medallion per team member

Second Place

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

Third Place

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

8. Four-year competition prizes

First Place

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

Second Place

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

Third Place

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

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

- Author an article to be used in STMA’s official 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.
- Preferred uses of SAFE First Place Funds
 - To create an Athletic Sports Field learning lab
 - *Ex:* build home plate/mound; small-scale field project involving painting, drainage, irrigation, mowing; renovating an infield, 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.

Exam Overview

The 2021 STMA Student Challenge will be conducted virtually. There will be two sections – an oral presentation and a virtual exam.

Oral Presentation

Teams will receive a scenario and present their solutions through both an oral presentation and written document. Teams are responsible for producing, recording, and submitting the presentation.

Timing:

Available for students to complete between Sept. 1 – Nov. 25.

Once a team receives the scenario, they have 7 days to complete the assignment.

Multiple teams from one school MUST complete the scenario within the same time frame.

Please contact Kristen Althouse (kalthouse@stma.org) when your team is ready to receive the scenario. Your entire team must be registered for the Student Challenge and be current STMA members before you receive the scenario.

Requirements:

Teams are required to submit a recorded video of the oral presentation supplemented by a written document outlining their solution.

Students will need to have access to a recording device and/or video conferencing program. The recorded presentation must be submitted in an MP4 format. See below for submission instructions.

The recorded presentation will be a minimum of 5 minutes, maximum 8 minutes. Anything below or above receives a 5 point deduction for every 5 seconds.

Team members must be visible in the video recording at all times. A PowerPoint presentation or other visual aid may supplement (but is not required) the presentation as long as it appears in the background. If students are in separate locations, a video conferencing program may be used to display all team members on the screen.

Each team member must be an active participant in the oral presentation.

Students must state their name and their school name at the beginning of the presentation and in the written document.

The presentation should be presented as if you are addressing your superiors. The written document should be written as if you were submitting it to your superiors.

For the oral presentation, minimum length is 5 minutes, maximum length is 8 minutes – every minute below 5 minutes or beyond 8 minutes will get a 5-point deduction for every 5 seconds.

The written document cannot exceed 3 pages. It must be typed, double spaced, Times New Roman, 12-point font with 1 inch margins. The written document must be submitted as a PDF.

Submission Instructions:

Teams will be required to submit a recorded oral presentation and written document:

Oral Presentation:

The oral presentation must be in an MP4 format. Please submit via WeTransfer – visit <https://wetransfer.com/> and follow the instructions to upload and send the oral presentation.

Email to kalthouse@stma.org. Please indicate your school and all team member names in the Message field.

Written Document:

Please email your written document to Kristen Althouse at kalthouse@stma.org. Please indicate your school and all team member names in the message.

Virtual Exam

Teams will complete the exam virtually. Each individual team member will take the exam separately to contribute to a team score. The virtual exam will be made up of multiple choice and identification.

Timing:

Available to complete Dec. 1 – Jan. 8.

All team members are REQUIRED to take the virtual exam at the same time.

Multiple teams from one school are REQUIRED to take the virtual exam at the same time.

This is a timed exam broken into two sections. Students may not leave their work station until they complete the section, or time runs out. It is broken into two sections so students have a break in the middle to take care of personal needs.

Please contact Kristen Althouse (kalthouse@stma.org) to schedule when your team will take the exam.

Requirements:

Each team member will need access to a computer with a working microphone and webcam and the ability to run Zoom. Materials a student may have available during the exam include a writing utensil, scrap paper, and calculator (this may not be a graphing calculator or phone calculator). Upon check-in, the student will be required to provide photo identification and a scan of their work environment to ensure the area is free of any other materials including notes and any type of electronics. Students will be required to display their work station at the

beginning, at random intervals during, and at the end of each section.

A CSFM proctor must be present for the duration of the exam. [Please visit the STMA website for a list of CSFM's](#). Your team is responsible for contacting and scheduling a proctor. Your advisor cannot be your proctor.

Students will be taking the test individually and cannot collaborate. Students cannot be in the same room to take the test.

Each student, for the entirety of the test, will be recorded with sound on.

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 seeds and/or morphological characteristics.
- 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.
- Read and understand a seed label.
- Understand the principles of the formulations of blends and/or mixtures of turfgrasses.
- 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.
- Identify soils based on their use in sports field management.
- 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, pH, cation exchange capacity, salt concentrations, phytotoxic contaminants, and nutrient availability.
- Read and understand a soil test.
- Understand the physical, chemical, and biological characteristics of soils and their influence on turfgrass growth.
- Understand how to choose a proper growing medium for turfgrass rootzones.

Soil Fertility

- Understand the fertilizer label and its components.
- Understand how to develop a fertilization plan based on soil test results.
- Be able to calculate the nutrients applied on an elemental basis for a given area and rate.
- 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.
- Have a general understanding how to plan and implement an annual fertility plan.

Irrigation

- 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.
- Identify irrigation system components and parts including valves, head, controllers, pipes, fittings, pumps, electrical elements and components of each of these. Identify “Smart Components” that enable water conservation in irrigation systems. Diagrams, photographs, or descriptions may be used.
- Read an irrigation schematic/blueprint and assemble/install an irrigation system based on specifications.

Drainage

- Understand the various types of drainage – internal, surface, and subsurface installed systems – and the benefits/disadvantages of each for use on sports fields.
- 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 between 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 perched and temporary water tables and how they affect sports fields.
- Understand the design criteria for a subsurface drainage system which includes: drainage patterns, pipe size, slope, and collector drains.
- Assemble/install a subsurface drainage system based on a schematic/blueprint.
- Be able to identify the different types of drainage pipe and system components including pipes, fittings, and backfill materials. This may include diagrams, photographs, or

descriptions.

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, seed, skinned area clay mixes, or other products used in sports field management.
- Calculate “pure live seed” amounts from a seed label.
- Calibrate liquid and dry material application equipment. Physical samples may be used.
- 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.
- Read and understand a pesticide label.
- Knowledge of pesticide safety such as safe handling, storage and disposal, and REI.
- Knowledge of distribution equipment including sprayer setup, pressures, nozzles, and pumps; broadcast and drop spreaders. Physical samples, diagrams, photographs, or descriptions may be used.
- 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. Diagrams, photographs, or descriptions may be used.
- Identify major turfgrass insect pests, understand their life cycles, and diagnose resulting turfgrass damage of both warm season and cool season turfgrasses. Diagrams, photographs, or descriptions may be used.
- Identify the major turfgrass diseases, understand their life cycles, and diagnose resulting turf grass damage of warm season and cool season turfgrasses. Diagrams, photographs, or descriptions may be used.

- Knowledge of how to troubleshoot turfgrass problems and create a corrective plan of action.

Sports Field Management – Turf Areas

- Understand general concepts dealing with safety, i.e. smoothness, consistency, Gmax, 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.
- Identify equipment, uses, depreciation, and equipment parts including mowers, aerifiers, sprayers, spreaders. Could include diagrams, photographs, or descriptions.
- Understand field marking and logo painting. This can include field layout and lining, stencils, painting technique, paint mixing, etc.
- Understand the effects weather has on sports field management including weather fronts; atmospheric moisture, relative humidity, and dewpoint; heat index; and severe weather safety
- 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.
 - Understand how thatch develops and how to manage thatch
 - 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

- Identification of the different types of soil conditioners and mound or home plate fortification materials (both natural and synthetic).
- Understand the various uses of soil conditioners on sports fields.
- Understand and outline pitcher's mound construction and maintenance.
- Surveyor's transit use: Measure heights using a transit and determine correct height of pitcher's mound and its slope.
- Understand and outline skinned area construction and maintenance including lip prevention and maintenance
- Understand grading and installation techniques associated with new construction projects and field reconstruction.
- Knowledge of general synthetic turf maintenance.
- Identification of synthetic turf maintenance equipment. Could include physical samples,

diagrams, photographs, or descriptions.

- Understand planning, preparation, and renovation/recovery associated with special events.

Sports Field Management - Administration

- Understand proper communication techniques including verbal and non-verbal methods.
- Knowledge of basic supervisory skills including time management, leadership techniques, team development, positive performance management, conflict management, etc.
- Knowledge of the budgeting process and the fiscal responsibilities inherent in turfgrass management.
- Knowledge of administrative principles of turfgrass management safety management systems.

The History of STMA

- Identify STMA's Founders
- Understand STMA's growth and establishment
- Knowledge of professional programs offered by STMA
- Knowledge of STMA's Mission and Vision

Weed List for STMA Collegiate Student Challenge

| | |
|---|--|
| Annual Bluegrass <i>Poa annua</i> | English Daisy <i>Bellis perennis</i> |
| Annual Sedge <i>Cyperus compressus</i> | |
| Barnyardgrass <i>Echinochloa crusgalli</i> | Fall Panicum <i>Panicum dichotomiflorum</i> |
| Bedstraw/Catchweed <i>Galium aparine</i> | Field Bindweed <i>Convolvulus arvensis</i> |
| Bermudagrass <i>Cynodon dactylon</i> | Foxtail <i>Setaria sp.</i> |
| Black Medic <i>Medicago lupulina</i> | Goosegrass <i>Eleusine indica</i> |
| Broadleaf Dock <i>Rumex obtusifolius</i> | Green kyllinga <i>Kyllinga brevifolia</i> |
| Broadleaf Plantain <i>Plantago rugelii and P. major</i> | Ground Ivy <i>Glecoma hederacea</i> |
| Buckhorn Plantain <i>Plantago lanceolata</i> | Hawkweed <i>Hieracium pratense H. aurantiacum</i> |
| Bull Thistle <i>Cirsium vulgare</i> | Healall <i>Prunella vulgaris</i> |
| | Henbit <i>Lamium amplexicaule</i> |
| Canada Thistle <i>Cirsium arvense</i> | |
| Carolina geranium <i>Geranium carolinianum</i> | Japanese stiltgrass <i>Microstegium vimineum</i> |
| Carpeweed <i>Mollugo verticillata</i> | |
| Chicory <i>Cichorium intybus L.</i> | Kikuyugrass <i>Pennisetum clandestinum</i> |
| Cinquefoil <i>Potentilla spp.</i> | Kochia <i>Kochia scoparia</i> |
| Common Chickweed <i>Stellaria media</i> | |
| Common groundsel <i>Oxalis montana</i> | Lambsquarter <i>Chenopodium album</i> |
| Common Mallow <i>Malva neglecta</i> | |
| Common Mullien <i>Verbascum thapsus</i> | Mouse Ear Chickweed <i>Cerastium vulgatum</i> |
| Crabgrass <i>Digitaria Sp.</i> | Musk Thistle <i>Carduus nutans</i> |
| Creeping Bentgrass <i>Agrostis stolonifera</i> | |
| Creeping Speedwell <i>Veronica filiformis, V. officinalis, V. serpyllifolia</i> | Nimblewill <i>Muhlenbergia scherberi</i> |
| Creeping Woodsorrel <i>Oxalis corniculata</i> | |
| Curly Dock <i>Rumex crispus</i> | Orchardgrass <i>Dactylis glomerata</i> |
| Cutleaf evening primrose <i>Oenothera laciniata</i> | Oxeye Daisy <i>Chrysanthemum leucanthemum</i> |
| | |
| Dallisgrass <i>Paspalum dilatatum</i> | Pennsylvania smartweed <i>Polygonum pennsylvanicum</i> |
| Dandelion <i>Taraxacum officinale</i> | Pennywort/Dollarweed <i>Hydrocotyle sp.</i> |
| Dogfennel <i>Eupatorium capillifolium</i> | Peppergrass/Virginia Pepperweed <i>Lepidium</i> |
| Downy Brome <i>Bromus tectorum L.</i> | |

virginicum

Pineapple Weed *Matricaria discoidea*

Prickly Lettuce *Lactuca serriola*

Prostrate Knotweed *Polygonum aviculare*

Prostrate Spurge *Euphorbia supina*

Puncture Vine *Tribulus terrestris*

Purslane *Portulaca oleracea*

Quackgrass *Agropyron repens*

Ragweed *Ambrosia* spp.

Red Sorrel *Rumex acetosella*

Sandbur *Cenchrus longispinus*

Shepard's Purse *Capsella bursa-pastoris*

Spotted Spurge *Euphorbia* (= *Chamaesyce*)
maculata

Star of Bethlehem *Ornithogalum*
umbellatum

Thymeleaf Speedwell *Veronica serpyllifolia*

Venice Mallow *Hibiscus trionum*

Violet *Viola papilionacea*

Virginia Buttonweed *Diodia virginiana*

Western Salsify *Tragopogon dubius*

White Clover *Trifolium repens*

Wild Carrot *Daucus carota*

Wild Garlic/Onion *Allium vineale*

Wild Strawberry *Fragaria virginiana*

Witchgrass *Panicum capillare*

Yarrow *Achillea millefolium*

Yellow Nutsedge *Cyperus esculentus*

Yellow Rocket *Barbarea vulgaris*

Yellow Woodsorrel/Oxalis *Oxalis stricta*

Accepted Names - Grasses

| Common Name | Latin Name |
|-----------------------------------|--|
| Creeping Bentgrass | <i>Agrostis stolonifera</i> |
| Colonial Bentgrass | <i>Agrostis capillaris</i> |
| Tall Fescue | <i>(Festuca arundinacea) Lolium arundinaceum</i> |
| Creeping Red Fescue | <i>Festuca rubra ssp. rubra</i> |
| Hard Fescue | <i>Festuca brevipila</i> |
| Chewings Fescue | <i>Festuca rubra ssp. commutata</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 var. dactylon</i> |
| Hybrid bermudagrass | <i>Cynodon dactylon x C. tranvaalensis</i> |
| Bahiagrass | <i>Paspalum notatum</i> |
| Kikuyugrass | <i>Pennisetum clandestinum</i> |
| St. Augustine grass | <i>Stenotaphrum secundatum</i> |
| Japanese Lawngrass (Zoysiagrass) | <i>Zoysia japonica</i> |
| Manilagrass (Zoysiagrass) | <i>Zoysia matrella</i> |
| Seashore Paspalum | <i>Paspalum vaginatum</i> |
| Carpetgrass | <i>Axonopus affinis</i> |
| Centipede grass | <i>Eremochloa ophiuroides</i> |

Insect List for the STMA Student Collegiate Challenge

****Both immature and mature specimens may be used for identification.**

Annual Bluegrass Weevil (*Listronotus maculicollis* Dietz)

Ants - Red Imported Fire Ants (*Solenopsis invicta*)

Armyworm (*Pseudaletia unipuncta*)

Asiatic Garden Beetle (*Maladera castanea*)

Bermudagrass Scale (*Odonaspis ruthae*)

Billbugs

Bluegrass Billbug (*Sphenophorus parvulus*)

Hunting Billbug (*Sphenophorus venatus vestitus*)

Denver Billbug (*Sphenophorus cicatristriatus*)

Phoenician Billbug (*Sphenophorus phoeniciensis*)

Black Turfgrass Ataenius (*Ataenius spretulus*)

Chinch Bugs

Hairy Chinch Bug (*Blissus leucopterus hirtus*)

Southern Chinch Bug (*Blissus insularis*)

Common Chinch Bug (*Blissus leucopterus leucopterus*)

Crane Fly (*Tipula paludosa*)

Cutworms

Black Cutworm (*Agrotis ipsilon*)

Bronzed Cutworm (*Nephelodes minians*)

Variiegated Cutworm (*Peridroma saucia*)

European Chafer (*Rhizotrogus (Amphimallon) majalis*)

Fall Armyworm (*Spodoptera frugiperda*)

Fiery Skipper (*Hylephila phyleus*)

Frit Fly (*Oscinella frit*)

Greenbug / Aphid (*Schizaphis graminum*)

Green June Beetles (*Cotinis nitida*)

Ground Pearls (*Margarodes meridionalis* and *Eumargarodes laingi*)

Japanese Beetle (*Popillia japonica*)

Leafhoppers (*Draeculacephala minerva* and *Deltacephalus sonorus*)

May and June Beetles (*Phyllophaga* species)

Masked Chafer

Northern Masked Chafer (*Cyclocephala borealis*)

Southern Masked Chafer (*Cyclocephala lurida*)

Mealybug

Rhodesgrass Mealybug (*Antonina graminis*)

Buffalograss Mealybug (*Tridiscus sporoboli*)

Mites

Eriophyid Mites

- Bermudagrass Mite (*Eriophyes cynodontensis*)
- Zoysiagrass Mite (*Eriophyes zoysiae*)
- Buffalograss Mite (*Eriophyes slykhuisi*)
- Grain Rust Mite (*Abacarus hystrix* and *Aculodes mckenziei*)

Noneriophyid Mites

- Clover Mite (*Bryobia praetiosa*)
- Banks Grass Mite / Timothy Mite / Date Mite (*Oligonychus pratensis*)
- Brown Wheat Mite (*Petrobia latens*)
- Winter Grain Mite / Blue Oat Mite / Pea Mite (*Pentheleus major*)

Mole Crickets

- Southern Mole Cricket (*Scapteriscus borellii*)
- Tawny Mole Cricket (*Scapteriscus vicinus*)
- Short-winged Mole Cricket (*Scapteriscus abbreviatus*)
- Northern Mole Cricket (*Neocurtilla hexadactyla*)

Oriental Beetle (*Exomala orientalis*)

Sod Webworms (*Crambus spp.*)

Two-lined Spittlebugs (*Prosapia bicincta*)

White Grubs - may include Japanese Beetle (*Popillia japonica*), May and June Beetles (*Phyllophaga species*), Northern Masked Chafer (*Cyclocephala borealis*), Southern Masked Chafer (*Cyclocephala lurida*), Green June Beetles (*Cotinis nitida*), European Chafer (*Rhizotrogus (Amphimallon) majalis*), Asiatic Garden Beetle (*Maladera castanea*), Oriental Beetle (*Exomala orientalis*), Black Turfgrass Ataenius (*Ataenius spretulus*)

Malady List for the STMA Student Collegiate Challenge

Biotic

Algae
Anthracnose Foliar Blight / Basal Rot
Black-Layer
Brown Blight
Brown Patch / Large Patch / Rhizoctonia
Blight

Copper Spot

Damping Off / Seed Rot
Dollar Spot

Fairy Ring

Gray Leaf Spot / Blast
Gray Snow Mold

Leaf Blotch
Leaf Spot / Melting Out

Necrotic Ring Spot
Net Blotch
Nematode damage

Pink Patch
Pink Snow Mold / Microdochium Patch /
Fusarium Patch
Powdery Mildew
Pythium Blight / Pythium Root Rot

Red Thread
Rhizoctonia Large Patch
Rust

Sclerotium Blight / Southern Blight
Slime Mold
Spring Dead Spot
Stripe Smut
Summer Patch

Take-All Patch
Take-All Root Rot / Bermudagrass Decline

White Patch / White Blight

Yellow Patch
Yellow Tuft / Downy Mildew

Abiotic

Abrasive injury
Animal damage - chemical
Animal damage – physical

Chemical spills
Cold weather damage

Drought stress

Equipment injury

Fertilizer misapplication

Hazardous material

Irrigation issues

Lightning Damage

Mixed stand of turfgrass

Pesticide misapplication

Shade
Soil compaction

Thatch
Traffic stress

Wilt
Wet wilt

Study Resources

Students have a wide variety of resources available to them. The following textbooks, along with STMA's monthly publication, *Sports Field Management* 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. Speak with your instructors, peers, and/or other industry professionals regarding topics in the general study guide. Start networking now! The STMA directory is available online to all student members and is full of quality industry professionals. Also be sure to check out the Institute on the STMA website (www.stma.org) to access various technical bulletins on sports field management.

Compendium of Turfgrass Diseases (*3rd Edition*) – Richard W. Smiley, Peter H. Dernoeden, and Bruce B. Clarke

Controlling Turfgrass Pests (*3rd Edition*) – Thomas W. Fermanian, Malcom C. Shurtleff, Roscoe Randell, Henry T. Wilkinson and Philip L. Nixon

Destructive Turfgrass Insects – Daniel A. Potter

Establishing and Maintaining the Natural Turf Athletic Field—Stephen T. Cockerham, Victor A. Gibeault, and Deborah B. Silva

Fundamentals of Turfgrass Management (*Fifth Edition*) – Nick Christians, Aaron Patton, Quincy Law

Handbook of Turfgrass Insects – Rick L. Brandenburg, Michael G. Villani

History of STMA – Session recording from 2014 Conference:
<https://www.intellicquestmedia.com/library/STMAHistory>)

Human Resource Management for Golf Course Superintendents – Robert A. Milligan, Thomas R. Maloney

Managing Turfgrass Pests – Thomas L. Watschke, Peter H. Dernoeden and David J. Shetlar

Mathematics for the Green Industry: Essential Calculations for Horticulture and Landscape Professionals – Michael L. Agnew, Nancy H. Agnew, Nick Christians, Ann Marie VanDerZanden

Practical Drainage for Golf, Sportsturf, and Horticulture – Keith McIntyre and Bent Jakobsen.

Irrigation Design and Technical Guides – Hunter Industries -
https://www.hunterindustries.com/resource_guide/tech-and-education-guides

Sports Fields: Design, Construction and Maintenance, Second Edition - Jim Puhalla, Jeff Krans, and Mike Goatley

Turfgrass Management (*Ninth Edition*) – A.J. Turgeon

Turfgrass Soil Fertility and Chemical Problems – R.N. Carrow, D.V. Waddington, and Rieke