Register at: greenkeeperapp.com
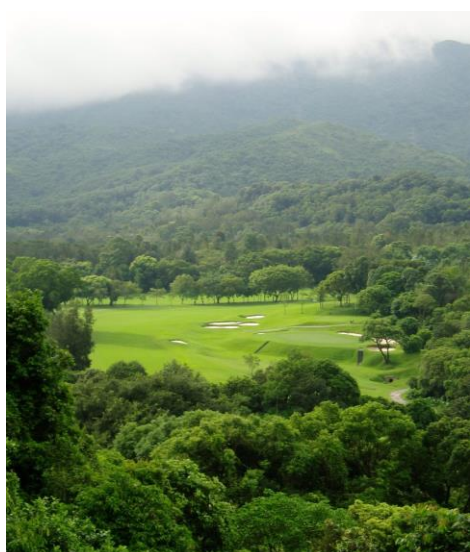
2021 Great Lakes School of Turfgrass Science: Cool-Season Golf Edition

Online Program (Jan. 11th – April 2nd, 2021)

- Live weekly discussions

- 10 internationally renowned turfgrass science faculty from across the Great Lakes Region

- 36 hrs of in-depth training in turfgrass science and management

Questions about the school?
Contact: Sam Bauer (sam@bauerturf.com, 904-271-0250)

Class fee: $550.00/person

This year offered at Greenkeeper University

2021 Great Lakes School of Turfgrass Science Instructors

Without question, the strength of this new online school lies within the depth and experience of the turfgrass faculty. This program allows for extensive interaction with researchers and educators having national and international recognition.

Sam Bauer, M.Sc.
Owner/Agronomist
BauerTurf, LLC
Wayzata, Minnesota

Paul Koch, Ph.D.
Assistant Professor
Department of Plant Pathology
University of Wisconsin-Madison

Bill Kreuser, Ph.D.
Assistant Professor
Department of Agronomy and
Horticulture
University of Nebraska-Lincoln

Aaron Patton, Ph.D.
*Associate Professor and Extension
Turfgrass Specialist*
Department of Agronomy
Purdue University

Kevin Frank, Ph.D.
*Associate Professor and Extension
Turfgrass Specialist*
Department of Crop and Soil
Sciences
Michigan State University

Frank Rossi, Ph.D.
*Associate Professor and Extension
Turfgrass Specialist*
Department of Horticulture
Cornell University

David Gardner, Ph.D.
Associate Professor
Department of Horticulture and
Crop Science
The Ohio State University

Doug Soldat, Ph.D.
*Professor and Extension Turfgrass
Specialist*
Department of Soil Science
University of Wisconsin-Madison

Brian Horgan, Ph.D.
*Professor and Extension Turfgrass
Specialist*
Department of Horticultural Science
University of Minnesota-Twin Cities

Chris Williamson, Ph.D.
Research Manager
PBI Gordon

Ed Nangle, Ph.D.
Assistant Professor
Horticulture Technologies
The Ohio State University

Eric Watkins, Ph.D.
Professor
Department of Horticultural Science
University of Minnesota-Twin Cities

2021 Great Lakes School of Turfgrass Science

School format:

Participants will work through a total of 12 sessions during the 12-week program. Each session will include readings, a 2-hour recorded lecture, a live 1 hour discussion with 3-4 instructors, quizzes, and a final test. Participants completing all sessions will receive a certificate of completion for the 2021 school. The required work can be completed beyond the 12-week school period.

Sessions include:

- **Turfgrass identification, physiology and growth**

- **Soil science and management**

- **Selection and establishment**

- **Nutrition and fertility programming**

- **Mowing and additional cultural practices**

- **Abiotic stresses**

- **Irrigation**

- **Insect biology, identification and management**

- **Disease biology, identification and management**

- **Weed biology, identification and management**

- **Specialty product usage**

- **Mathematics and calibration**

Expert instructors

Open to anyone

Fully online

Learn at your convenience

Earn CEUs

All questions regarding this course can be directed to:

Sam Bauer

**Email:
sam@bauerturf.com**

**Phone:
904-271-2050**

Register at: greenkeeperapp.com

2021 Great Lakes School of Turfgrass Science: Golf Edition

Course Syllabus

(Note: this syllabus may have minor changes throughout the class)

Sessions

Session 1: Turfgrass Identification, Physiology and Growth

Session open on: January 11th

Live discussion on: January 13th at 6pm Central U.S.

Lead instructor: Dr. David Gardner, The Ohio State University

Turfgrass identification, physiology and growth are critical aspects of turfgrass science that everyone in the industry should understand. This is often the first topic in any turfgrass education course, and for good reason. In this session, Dr. David Gardner will discuss the main species used in turfgrass management, including proper identification. We will also discuss the main aspects of turfgrass physiology and growth that are important to turfgrass managers. For those of you that have had prior turfgrass training, this session will be a good review. For others that lack formal turfgrass education, we hope that this session will reinforce the importance of being able to identify the species you are maintaining, and that it will help you to understand how your maintenance practices affect the growth of your turf.

Learning objectives for Session 1 include:

1. Participants can understand the taxonomy of turfgrasses.
2. Participants can describe the key features of turfgrass morphology that help with identification.
3. Participants understand the main usages, strengths and weaknesses of various species used as turfgrass.
4. Participants can explain the main differences in cool-season (C3) and warm-season (C4) growth.

Session 2: Soils

Session open on: January 18th

Live discussion on: January 20th at 6pm Central U.S.

Lead instructor: Dr. Doug Soldat, University of Wisconsin-Madison

Soils are the foundation for growing healthy turf. Many, if not the majority, of turf problems can be traced to poor soil conditions. Soils are complex and soil science is a multi-faceted field that involves chemistry, physics, and biology; this two-hour session will only be able to scratch the surface. However, the required readings and supplementary materials are intended to introduce

you to the terminology and the fundamentals of soil science so we may venture beyond these basics in the lecture and discussion.

Learning objectives for Session 2 include:

1. Participants will describe the key physical and chemical properties of soil that should be routinely measured and managed.
2. Participants will understand how to use the Web Soil Survey to evaluate soil properties at any US location.
3. Participants will understand the most common soil problems in turf areas and describe potential solutions and management strategies.

Session 3: Selection and Establishment

Session open on: January 25th

Live discussion on: January 27th

Lead instructor: Dr. Eric Watkins, University of Minnesota-Twin Cities

Selection and establishment practices are some of the most important considerations in preparing new turf sites for long term success, and also beneficial practices to understand when dealing with aging sites that are in need of repair. This session will be led by Dr. Eric Watkins.

Learning objectives for Session 3 include:

1. Participants can describe geographically where turfgrasses should be planted.
2. Participants can describe sites/uses where specific species should be planted.
3. Participants can explain the advantages of using blends/mixes when selecting seed.
4. Participants can explain what qualities to look for when purchasing quality seed.
5. Participants can explain how to maximize establishment success of seeded turfgrasses.

Session 4: Abiotic Stresses

Session open on: February 1st

Live discussion on: February 3rd

Lead instructors: Dr. Kevin Frank (Michigan State), Dr. David Gardner (Ohio State), Dr. Ed Nangle (Ohio State), and Sam Bauer (University of Minnesota)

Abiotic (non-living) effects on turfgrasses are very important for every turfgrass manager to understand. Certain cultural practices can help to minimize the damaging effects from some of these abiotic stresses, and a thorough understanding of the physiology behind abiotic stresses is required to identify the cultural practice(s) that will help alleviate stress to your turf. Some of the more common abiotic stresses that impact cool-season turf include: winter injury, shade, heat, salt damage, mowing injury, wear and traffic. In this session, join the lead by Drs. Kevin Frank, David Gardner, Ed Nangle, and Sam Bauer

Learning objectives for Session 4 include:

1. Participants can describe how heat or shade affect cool-season turfgrass.
2. Participants can describe the various types of winterkill.
3. Participants can describe how winterkill effects different cool-season species and consider practices to reduce winterkill.
4. Participants can discuss management practices to reduce turf injury from salt, drought, flooding, and mechanical damage.

Session 5: Fertility

Session open on: February 8th

Live discussion on: February 10th

Lead instructors: Dr. Brian Horgan, University of Minnesota-Twin Cities and Dr. Kevin Frank, Michigan State University

Turfgrass fertilization is a key fundamental for every turfgrass manager to understand. Whether you are maintaining high level turf on a spoon-feeding program, average maintenance turf on grounds and recreation areas, or low-input turf in lawn and landscape settings, this session will prepare you to make smart decisions when designing fertility programs and purchasing fertilizer products. Join the lead by Drs. Brian Horgan and Kevin Frank as we explore the world of turfgrass fertility.

Learning objectives for Session 5 include:

1. Participants will understand the essential elements for turfgrass growth and development.
2. Participants can describe the attributes of various fertilizer sources.
3. Participants can discuss the mechanisms for nitrogen release based on product type.
4. Participants will understand the main considerations in developing a nitrogen fertility program.
5. Participants can discuss the environmental issues associated with improper fertilization.

Session 6: Irrigation and Moisture Management

Session open on: February 15th

Live discussion on: February 17th

Instructors: Sam Bauer, North Central Turfgrass Association

Irrigation of turfgrass is a hot topic of today. Lawns and turfgrass represent the largest irrigated crop in the U.S. With increasing concerns of water consumption, availability and quality, turfgrass managers are constantly looking for ways improve the efficiency of their irrigation practices. Join Sam Bauer's lead on the discussion of turfgrass irrigation.

Learning objectives for Session 6 include:

1. Participants will understand moisture dynamics in turfgrass landscapes, including: soil water concepts, evapotranspiration, and replacement of water lost.
2. Participants will evaluate tools that can be used when managing water.
3. Participants will understand basic irrigation system components and applications.
4. Participants will evaluate strategies to reduce water use on golf courses.

Session 7: Mowing and Other Cultural Practices

Session open on: February 22nd

Live discussion on: February 24th

Lead instructor: Dr. Frank Rossi, Cornell University

Primary aspects of turfgrass management involve critical maintenance practices that enhance the functional and visual performance of the turf. Mowing is most fundamental maintenance practice and is defined as the periodic, mechanical removal of leaf tissue that induce important plant responses both physiological and morphological. Additionally, there are a variety of mowing strategies based on the site, turfgrass species and variety, as well as available supplementary resources and practices such as water, nutrients and pest management programs. Supplementary cultural practices, such as those used for soil management are often implemented to address existing and potential soil physical properties, notably surface organic matter accumulation and compaction. The goal of this session is to develop sustainable mowing and soil management programs. Whether you are maintaining a golf course, sports field, or other high quality turf surface, understanding the principles and concepts surrounding these practices will make you a better turfgrass manager. Join Dr. Frank Rossi (Cornell University) as he leads the discussion around mowing and additional cultural practices.

Learning objectives for Session 7 include:

1. Increase your awareness of turfgrass plant and soil responses to important maintenance practices designed for maximizing functional and visual performance.
2. Develop an understanding of the mechanical technology used in turf maintenance and key adjustments that adjust plant stress and enhance performance.
3. Establish a framework for the development of sustainable mowing strategies and soil management programs.
4. Integrate sustainable mowing and soil management programs with key aspects of nutrient and water management.

Session 8: Weed Management

Session open on: March 1st

Live discussion on: March 3rd

Lead instructor: Dr. Aaron Patton, Purdue University

Weed management principles are important for every turfgrass manager to understand. Turfed landscapes can become invaded by many traditional weed species or weedy grasses that are undesirable in a particular setting. We can classify turfgrass weeds based on several different criteria, including: growth habit, growth cycle, and biology.   Throughout this session we will

discuss what makes turfgrass weed control unique, including some strategies to help with the weed control decision process. Dr. Aaron Patton from Purdue University will be leading the discussion.

Learning objectives for Session 8 include:

1. Participants will understand the basics of weed control in turfgrass systems, including weed types, weed identification, and herbicides for control.
2. Participants will evaluate the weed control decision model and understand the steps for proper weed control.
3. Participants will be able to discuss the factors associated with herbicide resistance in weeds.
4. Participants will know where to find additional weed control information.

Session 9: Disease Management

Session open on: March 8th

Live discussion on: March 10th

Lead instructor: Dr. Paul Koch, University of Wisconsin-Madison

Turfgrass disease management is constantly evolving as new products enter the marketplace and different pathogens occur in various situations. Still, the fundamentals of disease management remain unchanged. In this session, Dr. Paul Koch (UW-Madison) will discuss the fundamentals of turfgrass disease management and some of the current issues facing golf course turf.

Learning objectives for session 9 include:

1. Understand the difference between the signs and symptoms of a disease.
2. Know what general environmental factors are important for the development of most turfgrass diseases.
3. Be able to name 3-5 cultural strategies for reducing or suppressing disease.
4. Understand the primary phytomobility (i.e. topical modes of action) classes of turfgrass fungicides and the advantages and disadvantages of each.
5. Know how to use Fungicide Resistance Action Committe (FRAC) codes to manage fungicide resistance.

Session 10: Insect Management

Session open on: March 15th

Live discussion on: March 17th

Lead instructor: Dr. Chris Williamson, University of Wisconsin-Madison

Insect pressures are continually changing in various turf management conditions. From grubs to worms and weevils, there are numerous insects that are problematic in turf. Join Dr. Chris Williamson (UW-Madison) for this in-depth discussion on insect management.

Learning objectives for Session 10 include:

1. Participants can describe the key insect pests in turf.
2. Participants can describe biology (life cycle, behavior, ecology, etc.) of insect pests in turf.
3. Participants can explain the damage signs and symptoms of insect pests in turf.
4. Participants can explain the appropriate management strategy(ies) of insect pests in turf.

Session 11: Specialty Products

Session open on: March 22nd

Live discussion on: March 24th

Lead instructor: Dr. Ed Nangle, Ohio State University

Specialty products used for turfgrass management include plant growth regulators, biostimulants, wetting agents, pigments, and other products with highly specific uses. Most of these products are used by the professional turfgrass managers on golf courses or high quality athletic fields, but they could also be used to combat problems or improve turf in other turf areas. Dr. Ed Nangle has packed this session full of great readings and supplemental resources. Dr. Nangle will also be leading the discussion on specialty products.

Participant learning objectives for Session 11 include:

1. Participants gain an understanding of the various specialty products used in turfgrass management.
2. Participants can decide whether some of the specialty products would be useful in their turfgrass management programs.
3. Participants will understand the hydrophobic nature of some soils and evaluate wetting agent options to improve the uniform wetting of soils.
4. Participants will receive an overview of plant growth regulators and their modes of action

Session 12: Calibration and Mathematics

Session open on: March 29th

Live discussion on: March 31st

Lead instructor: Dr. Eric Watkins, University of Minnesota-Twin Cities

Turfgrass calibration and mathematics are very important topics for both seasoned veterans and those new to the field of turfgrass management. Inaccurate calibrations of sprayer and spreader equipment can often lead to over-applications which result in potential plant or environmental harm, or under-applications which result in incomplete control of target pests or an undesirable fertility rate. The basics of turfgrass calibration and mathematics should be thoroughly ingrained in the minds of anyone making applications to manage turfgrass. For this session, join Dr. Eric Watkins' lead as we discuss the concepts surrounding calibration and mathematics. Dr. Watkins will talk you through some of the easiest and most effective ways to calibrate equipment and make calculations on the spot.

Participant learning objectives for Session 12 include:

1. Participants will understand the reasons for accurately calibrating spray and spreader equipment.
2. Participants will understand the various distribution patterns for application equipment and how this affects the application strategies.
3. Participants will know how to calibrate both granular and liquid application equipment.
4. Participants will understand how to accurately calculate various math problems common to the turfgrass industry.