Becoming a Certified Turfgrass Professional requires the successful candidate to demonstrate a wide knowledge of turfgrass management principles and strategies unique to the transition zone. The certification training manual was developed to serve as a comprehensive review of 13 major areas of importance in managing a healthy, environmentally sound turfgrass. An intensive review of the training manual chapters is recommended, but the following particular areas from each chapter represent the most critical areas for review in order to become a Certified Turfgrass Professional.

Chapter 1. Turfgrass Identification
- know the definitions and locations of the most prominent above-ground and below-ground parts of a turfgrass plant
- know the basic vegetative identification features of the major cool and warm season grasses grown in the mid-Atlantic (Kentucky bluegrass, tall fescue, perennial ryegrass, fine-leaf fescues, creeping bentgrass, bermudagrass, zoysiagrass, centipedegrass, and St. Augustinegrass)
- understand the three types of inflorescences (seedheads) of the turfgrasses and the grass they are associated with

Chapter 2. Adaptation and Primary uses of Mid-Atlantic Turfgrasses
- understand the inherent strengths and weaknesses of the major cool and warm season turfgrasses grown in the mid-Atlantic and how these characteristics are used in the selection and management of these grasses for various climates and uses
- know the seasonal growth patterns of cool and warm-season turfgrasses and how these patterns are used in successful establishment, fertilization, and cultural management programs

Chapter 3. Turfgrass Growth and Development
- understand the process of seed germination and how environmental factors influence the rates of germination and seedling establishment
- know what the terms ‘C3’ and ‘C4’ mean
- understand the similarities and inherent differences in photosynthesis and respiration between C3 and C4 turfgrasses and how these processes are altered by the environment
- understand the basic processes in leaf, stem and root growth and how they are affected by their environment and management

Chapter 4. Principles of Soil Science for Turfgrass Managers
- Understand the five major functions of soil
- understand the basics of how soils are formed, the development of horizons, and the basic principles of how turfgrass managements strategies differ according to the soil used as a growing medium
- understand the importance of soil texture (classifying something as sand, silt, clay or some combination) as it relates to both physical and chemical properties of that soil
- understand the interactions of soil porosity (both micro and macropores) and the forces involved in the movement or retention of soil water

- understand how to read a soil textural triangle in defining the 12 primary classes of soil texture

- know the basic classification sizes of soil particles as defined by the United States Department of Agriculture

- understand the concept of soil structure and how it is affected by modification and/or cultural management programs

- understand the importance of naturally occurring and supplemental soil organic matter and its management

- know the basic principles in surface and subsurface soil drainage and how water movement can be affected either intentionally or unintentionally through installation and management of various soil media

- understand soil pH, how it is managed, and its importance

- understand the concept of Cation Exchange Capacity (CEC) and how it is managed

- know the essential elements for turfgrass growth and development

- understand the strengths and weaknesses of complete and partial soil modification

Chapter 5. Turfgrass Nutrient Management Strategies and Programming for Establishment and Maintenance

- Understand what nutrients commonly used in turfgrass management are of most concern in the protection of water quality

- know the basic parts of a turfgrass nitrogen cycle and how N can be utilized and/or lost in the environment

- know the plant available forms of N

- understand the value of a soil test and how to interpret its results

- understand the inherent differences in developing and implementing fertility programs for establishment and maintenance of turfgrasses

- understand the basics in developing and altering fertility programs according to the turfgrass selected, its use, and its location

- know the differences in water soluble and water insoluble (i.e. slowly available) N sources and how these differences are accounted for in developing nutrient management programs

Chapter 6. Irrigation Management Principles

- understand how climate, season, and the turfgrass selected affects the need for supplemental water
-be able to define evapotranspiration (ET) and how it is used in developing irrigation replacement programs

-understand the differences in the concepts of drought avoidance and drought tolerance and the relative ranks of the grasses for each category

-understand the basic principles in irrigation scheduling and how to calculate estimated plant available water (PAW)

-understand the concept of distribution uniformity, how it is measured, and what levels of DU are considered acceptable for an irrigation system

-understand how water quality can be affected by salinity, sodium

-what does EC and SAR stand for and why are they important to know when considering water quality

Chapter 7. Mowing Principles and Practices

-understand the relative cutting heights of the primary turfgrasses grown in the transition zone

-understand the 1/3rd rule of mowing and how cutting heights are altered for warm and cool-season grasses as the seasons and maintenance strategies change

-understand the basic type of mowing equipment and the strengths and weaknesses of their cutting action

-understand the basics of clipping management and the concept that returning clippings to the lawn serves as organic fertilizer and helps protect water quality

Chapter 8. Turfgrass Establishment

-know the appropriate steps and value in proper soil preparation prior to establishment for all planting methods

-understand the establishment windows for warm and cool-season grasses and the challenges associated with plantings outside the desired window

-understand the principles in basic establishment methods of seeding, sodding, sprigging, and plugging

-know the principles in site preparation, introduction of seed into warm-season grasses, and basic maintenance principles of winter overseeding

-understand how irrigation management changes for the establishment method and the stage of turfgrass development following planting

Chapter 9. Insects of Primary Importance in Virginia Turfgrass Management

-understand the definition of an insect and how it differs from other similar organisms

-understand the basic life cycles, distribution, life stages and feeding habits of the soil-borne (primarily grubs) and above-ground (primarily caterpillars) insects of importance in the transition zone.
-what is the purpose of the raster pattern and where is it located?

-understand the basic insecticide families and their strengths and weaknesses for use in turfgrass systems

Chapter 10. Weed Management in Turfgrass

-how do you define a weed?

-review the cultural controls that when effectively managed can greatly reduce weed populations

-familiarize yourself with the 30 weeds of common importance in the transition zone

-know the definitions of perennial and annuals for the weeds and when they are most likely to occur in the lawn and landscape

-understand the basics of general mechanical control methods such as hand weeding, mowing, string trimming, solarization, and shading

-understand the principles in selecting appropriate herbicides for the weed and the situation

-what does ‘LD 50’ mean and why is it of importance to you.

-what does ‘preemergence’ and ‘postemergence’ mean in relation to weed control programs?

-what are the basic differences between grasses, broadleaves, and sedges?

-familiarize yourself with the most important herbicides for preemergent and postemergent uses in the transition zone

Chapter 11. Disease Management in Turfgrass

-there are numerous definitions associated with turfgrass diseases that a certified turfgrass professional should have a working definition of. For instance, what is a disease? What are examples of abiotic and biotic disease agents? What is the difference between a sign and a symptom? These definitions and others are provided on the first page of this chapter.

-understand the concept of the disease triangle

-appreciate the value of an integrated approach in disease management that considers cultural programs, nutrition, mowing height, moisture management, and managing thatch

-understand the most common diseases of turfgrasses in the transition zone, their primary hosts, when they occur, and basic strategies in cultural and chemical management

-be able to visually distinguish the signs and symptoms of these diseases in order to successfully pass the pest identification section

Chapter 12. Principles in Sprayer and Spreader Calibration

-understand how to calculate square footage of randomly sized areas
-familiarize oneself with the basic setup of calculations utilized in sprayer and spreader calibrations
-understand the basic principles in drop and rotary spreader calibration and the strengths and weaknesses if each of these delivery methods
-understand the basic components of a spray system and the steps in accurately calibrating a system intended to utilize water as a carrier

Chapter 13. **Best Management Practices (BMPs) in Protecting Turfgrass Water Quality**

--understand the three primary uses of turfgrass (recreational, aesthetic, and functional) and the ways that a properly managed turfgrass actually protects/improves the environment
-understand the difference between point source and nonpoint source pollution of waterways
-know the meaning of eutrophication, why it occurs, what nutrients are involved in the process, and how managed turfgrass systems might contribute to its development
-what are the primary ways that nutrients are moved into water ways and how can this be prevented?
-what is stormwater?
-what is a nutrient management plan (NMP)? What is the certified fertilizer applicator (CFA) program? What is the water quality agreement (WQA) program?

-familiarize yourself with the wide variety of cultural and chemical management strategies that serve as stormwater best management practices (BMPs) for the protection of water quality