**Pennsylvania FFA Turfgrass Management**

**Career Development Event**

I. Purpose of Event

The Pennsylvania FFA Turfgrass Management Career Development Event includes all aspects of the industry in producing, marketing, utilizing, and maintaining turfgrass as well as related products, equipment and services. This event will stimulate a career interest, encourage proficiency development, and recognize excellence in students of turfgrass management through the agricultural education curriculum. FFA activities are an integral part of the instructional program in Agriculture, Food, and Natural Resources Education.

II. Objectives

A. To demonstrate the ability to identify turfgrasses, weeds and diseases common in Pennsylvania.

B. To demonstrate knowledge of the principles and skills involved in propagation, growth requirements, growing techniques, marketing and maintenance of turfgrass.

C. To demonstrate the ability to identify, select, use, and maintain appropriate supplies

and equipment for turfgrass management.

D. To demonstrate skills in oral and written business communications.

E. To understand marketing principles and demonstrate proper sales and service skills.

F. To demonstrate the ability to prepare accurate and legible records and reports, and to interpret business documents.

III. Event Rules

A. A team will consist of four (4) team members with only the three highest individual scores being totaled for the team score. Teams with fewer than three members are not eligible for team awards, but students may receive individual awards.

B. Participants are NOT allowed to use (or have visible) electronic devices during the event, unless for medical reasons. This includes cell phones, iPods, iPads, mp3 players, smart watches, etc. Participants will be allowed to use calculators, if specified; however, cell phone calculators and graphing calculators are not permitted.

C. This event will be scored using an answer sheet and test booklet as needed. It is important that students follow instructions and fill out the sheets correctly in order to receive credit.

D. Materials to be provided by students: Two pencils or pens, clipboard, and calculator

E. This event will be held rain or shine.

IV. Event Format

The contest has 4 phases, totaling 300 points individually and 1800 points as a team.

**Tuesday**

Takes place in a PSU classroom

**Phase 1: General Knowledge Examination**

100 points individually, 400 team points

All team members complete individually

Fifty (50) to one hundred (100) question exam to evaluate the participant’s knowledge. The exam will test the student’s knowledge in the following areas:

* Turfgrass Identification, Selection, and Morphology
* Cultural practices including mowing, fertility, irrigation, aeration, topdressing, etc.
* Soils
* Drainage
* Turfgrass Mathematics
* Pest Management
* Golf course management
* Sports field management for turf and non-turf areas
* Equipment operation

If there is time on Tuesday, students could be exposed to guest speakers involved in the turfgrass industry (sports field manager, golf course superintendent) or tour Penn State facilities such as Valentine Turfgrass Research Center or the Penn State Golf Courses.

**C. Wednesday**

Takes place at Valentine Turfgrass Research Center

**Phase 2: Identification**

200 points individually, 800 team points

All team members compete individually

Phase 2A: Turfgrass Species and Seed – 10 specimens at 5 points each (50 points total)

Phase 2B: Broadleaf and Grassy Weeds – 10 specimens at 5 points each (50 points total)

Phase 2C: Soil – 10 samples at 5 points each (50 points total)

Phase 2D: Equipment – 10 pieces at 5 points each (50 points total)

Samples will be presented as an intact live specimen, photograph, or preserved specimen. Each specimen will be designated by a station number. When the participant identifies the item, its number is recorded on the answer sheet. Word banks will accompany samples. See Section VIII for lists of what may appear on the test.

**Phase 3: Practicum**

200 team points

Teams will work together at each station. There will be 10 stations with teams spending 10 minutes at each station. Each station will be worth 20 points. Stations may include the following, but are not limited to:

* Turfgrass seed ID, interpreting a seed label, and Pure Live Seed calculation
* Fertilizer calculation
* Interpreting a pesticide label
* Irrigation case study
* Interpreting a soil test
* Pesticide calculation
* Turfgrass disease identification (see Section VIII for disease list)
* Equipment case study
* Turfgrass insect identification (see Section VIII for insect list)
* Programming an irrigation controller
* Interpreting blueprints
* Using a transit
* Equipment operation
* Irrigation construction
* Baseball mound repair
* Fertilizer/pesticide calibration

**Phase 4: Team Event**

100 team points

Students compete as a team to conduct a site evaluation.

**Event Wrap-Up**

Wednesday will conclude with tours and/or guest speakers that will further expose them to professions in turfgrass science. We are planning for a tour of Beaver Stadium and PSU Athletic Facilities.

V. Tiebreakers

If ties occur, the following sections will be used in order to determine award recipients:

Team and Individual

1. Written Exam

2. Identification

VI. Event Snapshot

Below is a brief overview of the Turfgrass Management CDE

A. This event will have four (4) phases. Phase 1 will occur on Tuesday. Phases 2-4 and the Event Wrap-up will occur on Wednesday:

a. Phase I- General Knowledge Exam- 100 points (60 minutes)

b. Phase II- Identification of turfgrass species and seed, broadleaf and grassy weeds, soils and equipment—200 points (40 minutes)

c. Phase III- Team Practicum—200 points (100 minutes)

d. Phase IV- Team Event - 100 points (45-60 minutes)

Scoring:

Total Possible Individual Points- 300 points

Total Team Score- 1800 points

VII. References

* Turgeon and Kaminski (2019). Turfgrass Management (Current Edition)
* Christians and Agnew (2008). The Mathematics of Turfgrass Maintenance (Fourth

Edition).

* Emmons and Rossi (2015). Turfgrass Science and Management (Fifth Edition).
* Puhalla, Krans, and Goatley (2010). Sports Fields: Design, Construction, and

Maintenance.

* Walker (2009). The Field Guide: The Layout and Dimensions of Sports Fields.
* Smiley, Dernoeden, and Clarke (2005) Compendium of Turfgrass Diseases (Third Edition)
* Uva, Neal, and DiTomaso (1997). Weeds of the Northeast.
* Penn State Center for Turfgrass Science – Plant ID - <https://plantscience.psu.edu/research/centers/turf/extension/plant-id>
* Brandenburg and Villani (1995). Handbook of Turfgrass Insect Pests.
* Penn State Center for Turfgrass Science – Resources on Professional Turfgrass Management - <https://plantscience.psu.edu/research/centers/turf/extension/professional-turf>

VIII. Specimen Lists

Turfgrass Species and Seed

* Creeping Bentgrass (*Argrostis palustris)*
* Velvet Bentgrass (*Agrostis canina)*
* Kentucky Bluegrass (*Poa pratensis)*
* Rough Bluegrass (*Poa trivialis)*
* Annual Bluegrass (*Poa annua)*
* Perennial Ryegrass (*Lolium perenne)*
* Annual Ryegrass aka. Italian Ryegrass (*Lolium multiflorum)*
* Tall Fescue (*Festuca arundinacea)*
* Fine Fescue (includes: *Festuca rubra ssp.rubra, Festuca rubra ssp. Cumnutata)*
* Bermudagrass (*Cynodon dactylon*)
* Buffalograss (*Bouteloua dactyloides*)
* Centipedegrass (*Eremochloa ophiuroides)*
* St. Augustinegrass (*Stenotaphrum secundatum)*
* Seashore Paspalum (*Paspalum vaginatum)*
* Zoysiagrass (*Zoysia japonica*)

Broadleaf and Grassy Weeds

* *Poa annua* Annual Bluegrass
* *Echinochloa crusgalli* Barnyardgrass
* *Agrostis sp.* Bentgrass
* *Cynodon dactylon* Bermudagrass
* *Digitaria Sp.* Crabgrass
* *Setaria sp.* Foxtail
* *Eleusine indica* Goosegrass
* *Muhlenbergia scherberi* Nimblewill
* *Dactylis glomerata* Orchardgrass
* *Agropyron repens* Quackgrass
* *Festuca arundinacea* Tall Fescue
* *Cvperus esculentus* (yellow) Nutsedge
* *Cvperus rotundus* (purple) Nutsedge
* *Allium vineale* Wild Garlic/Onion
* *Medicago lupulina* Black Medic
* *Plantago rugelii and P. major* Broadleaf Plantain
* *Plantago lanceolata* Buckhorn Plantain
* *Cirsium vulgare* Bull Thistle
* *Cirsium arvense* Canada Thistle
* *Mollugo verticillata* Carpetweed
* *Stellaria media* Common Chickweed
* *Cerastium vulgatum* Mouseear Chickweed
* *Taraxacum officinale* Dandelion
* *Kyllinga brevifolia* Green kyllinga
* *Glecoma hederacea* Ground Ivy
* *Oxalis montana* Common groundsel
* *Hieracium pratense H. aurantiacum* Yellow/Orange Hawkweed
* *Prunella vulgaris* Healall
* *Lamium amplexicaule* Henbit
* *Microstegium vimineum* Japanese stiltgrass
* *Polygonum aviculare* Knotweed
* *Malva neglecta* Mallow
* *Verbascum thapsus* Mullien
* *Polygonum pensylvanicum* Pennsylvania smartweed
* *Hydrocotvle sp.* Pennywort (Dollarweed)
* *Portulaca oleracea* Purslane
* *Poa trivialis* Rough Bluegrass
* *Rumex acetosella* Sheep Sorrel
* *Capsella bursa-pastoris* Shepherds purse
* *Veronica filiformis, V. Officinalis,V. serpvllifolia* Creeping Speedwell
* *Veronica arvensis* Corn Speedwell
* *Euphorbia maculata & E. supina* Spurge
* *Holcus lanatus* Velvetgrass
* *Trifolium repens* White Clover
* Daucus carota Wild Carrot
* *Oxalis stricta* Yellow Woodsorrel
* *Achillea millefolium* Yarrow
* *Barberea vulgaris* Yellow Rocket

Turfgrass Soils

* Brick Dust
* Calcined Clay
* Clay Rootzone
* Compost
* Crumb Rubber
* Diatomaceous Earth
* Drainage Stone
	+ Pea gravel
* Expanded Shale
* Infield Mix
* Limestone
* Mound Clay
* Native Soil Rootzone
	+ Heavy clay
	+ Loam
* Peat
* Sand
	+ Topdressing Sand
	+ Sand Rootzone
	+ Silica sand
* Topsoil
* Vitrified Clay
* Warning Track Material
* Zeolite

Turfgrass equipment

* Aeration Equipment
	+ Air Injection
	+ Deep Drill
	+ Fraise Mower
	+ Hollow tines
	+ Hollow tine aerator
	+ Solid tines
	+ Solid tine aerator
	+ Spiker/Slicer
	+ Vertical Mower/Verticutter
	+ Water Injection
* Air Filter
* Blower
* Broom
* Diaphragm Pump
* Drag Mat
* Edger
* Fertilizer Spreader
	+ Drop
	+ Rotary
	+ Tractor Mounted
* Front End Loader
* Fuel Filter
* Fuel Tank
* Grader/Laser Level
* Groomer
* Hydraulic Filter
* Hydraulic Line
* Hydraulic Pump
* Hydraulic Reservoir
* Mowers
	+ Flail
	+ Reel
	+ Rotary
* Oil Filter
* Painter
* Reel Mower HOC Gauge/Accu-Gage
* Reel Mower Components
	+ Spider
	+ Reel cylinder
	+ Reel blade
	+ Shaft
	+ Bedbar
	+ Bedknife
	+ Bedknife adjuster
	+ Roller
	+ Roller adjuster
* Rotary Mower Components
	+ Mulching blades
	+ Bench grinder
	+ Balancer
* Roller
* Seeder
* Skid-Steer
* Sod cutter
* Soil Probe
* Sprayers
	+ Backpack
	+ Boom
* Sweeper
* Tamp
* Topdresser
* Tractor
* Transit
* Trencher
* Trimmer - Line trimmer/weed whacker
* Utility Vehicle
* York Rake

Turfgrass diseases

* Anthracnose
* Brown Patch
* Dollar Spot
* Fairy Ring
* Gray Leaf Spot
* Gray Snow Mold
* Helminthosporium Leaf Spot
* Necrotic Ring Spot
* Nematodes
* Pink Snow Mold
* Powdery Mildew
* Pythium Blight
* Red Thread
* Rust
* Spring Dead Spot
* Summer Patch
* Take-all Patch

Turfgrass insects

* Annual Bluegrass Weevil
* Armyworms
* Asiatic Garden Beetle
* Black Turfgrass Ataenius Beetle
* Bluegrass Billbugs
* Chinchbugs
* Cutworms
* Fall Armyworm
* Fire Ants
* Green June Beetle
* Japanese Beetle
* May and June Beetles
* Masked Chafer
* Mites
* Mole Crickets
* Oriental Beetle
* Sod Webworms
* White Grubs