

SFMA Pre-Conference Education:
Disease ID

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The disease triangle: driving principle of plant pathology

Environment
Host
Pathogen
Disease
4th Dimension = TIME

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NOAA: Updates found here

Weather patterns impact disease

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What is causing the decline?

Biotic "disease" Abiotic "disorder"

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Pathogen (Biotic): any disease-producing organism

Fungi Nematodes

Bacteria Virus

Kevin Qing, Texas Agrilife Extension Service, bugwood.org
Curtis A. Langston, University of Georgia, www.ces.uga.edu/extension/extension-services/extension-services/

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Disease complex: disease resulting from combined or sequential actions of two or more biotic or abiotic agents

Multiple biotic agents Biotic and abiotic

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Warm-season vs. cool-season grasses
Timing of disease development

- Plants under stress are more susceptible to disease than healthy plants
- Warm season grasses: entering dormancy and spring green-up
- Cool season grasses: summer months, when growth is limited

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Spring dead spot
Hosts: bermudagrass, sometimes zoysiagrass
Pathogen(s): *Ophiosphaerella* spp.
Environment: Soil temps 55-75°F (monocyclic disease)

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Large patch (zoysia patch)
Hosts: warm-season grasses
Pathogen: *Rhizoctonia solani*
Environment: spring/fall transitions

Photo: Adam Nichols
 Photo: Craig Zeidler

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Differentiating Spring Dead Spot & Large patch

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Dollar spot
Hosts: creeping bentgrass, bermudagrass, Kentucky bluegrass, others
Pathogen: *Claviceps* spp. (*Sclerotinia homoeocarpa*)
Environment: warm days, cool nights, heavy dew

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Pythium blight (Greasy spot)
Hosts: perennial ryegrass, tall fescue, bermudagrass, creeping bentgrass, others
Pathogen: *Pythium aphanidermatum* (and others)
Environment: Prolonged wet (and typically hot)

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Gray leaf spot
Hosts: perennial ryegrass, tall fescue, St. Augustinegrass
Pathogen: *Pyricularia grisea*
Environment: wet and humid, typically during high temperatures



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Submitting a good sample



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Disease/Pest Distribution

Crop Science
Geostatistical Analysis of Dollar Spot Epidemics Occurring on a Mixed Sward of Creeping Bentgrass and Annual Bluegrass
 R. J. Norrish, A. N. Franchini, G. P. Robertson, J. M. Vigaraj
 1st published: 01 May 2007 | <https://doi.org/10.2139/ssrn.com/996966> | CiteSpace: 11


Heterogeneous Distribution of Weedy *Paspalum* Species and Edaphic Variables in Turfgrass
 Gerald M. Henry*
 Department of Plant and Soil Science, Texas Tech University, Box 4222, Lubbock, TX 79409
 Michael G. Burton and Fred H. Volterton
 Department of Crop Science, North Carolina State University, Raleigh, N. C. 27695-7620



Spatial Distribution of Hunting Billbugs (Coleoptera: Curculionidae) in Sod Farms
 Mathias Gieseké, Johannes P. Kijál, and Mounir Y. Joseph


Sample Summary: The hunting billbug is the most destructive and damaging insect pest species of sod farms (sod production is commercially produced in Georgia (GA)). The larvae feed within the turfgrass roots and cause stunted growth. Hunting billbugs are usually managed using insecticides. However, the application of insecticides to entire sod fields is not an economically and practically feasible option. Thus, an improved sampling plan for sod farms and sod farms is warranted to improve management decisions. The current study was aimed at understanding the spatial distribution of hunting billbug larvae and adults in sod farms using geostatistical techniques. The sod farms and adults were sampled using soil cores and pitfall traps, respectively. After evaluating two geostatistical techniques, the descriptive statistics of hunting billbug larvae and adults within the sod farms was significant. The presence of billbugs in sod farms collected at the same region were not independent. This information will help sod farms improve pest management by hunting billbugs in sod farms and further describe the hunting billbug and the sod farm sites.

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**Maps Guide the Way:
 Building Pest Maps for Targeted Applications**



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