



Damage caused by insects like the hunting billbug can open the door to other pest invasions like diseases and weeds.

Insect Damage Allows Other Pests to Thrive

By Doug Richmond

Too often, turf managers will point a finger at weeds or poor fertility when turfgrass starts to look bad. In many cases, however, these outward signs are only symptoms of a much less obvious problem — root-feeding insects.

It is important to remember that the foundation for insect management is built on cultural practices that promote healthy turfgrass plants. Healthy plants are more tolerant of insect feeding and are better able to recover from damage.

Proper turfgrass species and cultivar selection, mowing height, fertility, and water management can all decrease the likelihood that insect pests will cause noticeable damage in the first place. For instance, there is strong evidence that proper fertility management can have a disproportionate influence on plant susceptibility to insects, diseases and other environmental stresses. Overfertility or poorly timed fertility can reduce root growth, making plants more vulnerable to drought and damage by root-feeding insects. Excess fertility can also promote the growth of succulent tissues that insects and diseases favor. On the other hand, soil insects can also be at the root of problems that are not so obviously related.

Although root-feeding insects can reduce the vigor of turfgrass plants, only rarely do we make the connection between this damage and other ensuing problems such as diseases or weed invasions. In fact, we tend to think of weeds, insects and diseases as separate and independent concerns in turfgrass management. To a large extent, our approach toward research and extension reflects this thinking. However, most biologists would admit that there can be a great deal of interdependence among these different components, even if the connections aren't always obvious.

A turfgrass manager who relies on his/her biological knowledge to solve pest problems will have a broader view of how turfgrass systems work and will be more likely to make proper diagnoses.

When turfgrasses are attacked by insects such as billbugs or white grubs, their ability to compete with encroaching weeds is compromised. Worse yet, when turfgrass plants die as a result of insect damage, the new occupant of the formerly turfgrass-covered site will likely be a weed.

In a recent study, I watched weed invasions into stands of Kentucky bluegrass suffering from different levels of billbug damage. At the undamaged site, few weed seedlings were ever present,

Continued on page 80

TORO

QUICK TIP

Tax advantages abound in 2004 for golf courses acquiring capital equipment. Check with your course owner or controller to see if the Jobs and Growth Tax Relief Reconciliation Act of 2003 has been evaluated and if there is an opportunity to take advantage of this year's special tax incentives to acquire new equipment.

Continued from page 79

and none of these weeds were able to establish. However, at the site where moderate billbug damage was apparent, weeds became a significant problem.

What would be the normal course of action for a turfgrass manager under the previous circumstances? Billbug damage, for example, is often misdiagnosed as dormancy, drought stress, or soil compaction, so it may be easy to overlook a billbug problem. An effort could be made to relieve suspected soil compaction through aerification or to irrigate to revive the turfgrass. However, neither of these measures will completely solve the problem.

I suspect that most of us would reach for the herbicide to get rid of the encroaching weeds, and this would most likely be effective over the short term. Unfortunately, the herbicide will have little effect on the billbugs, which are likely to be a chronic problem. So year after year herbicide applications may be made to an ever-enlarging area, but this will only be treating the symptoms of the problem. The tug-test would have quickly revealed the billbug infestation, and a one-time insecticide treatment would have significantly reduced billbug numbers.

Because billbugs are slow to migrate into new areas, another application would likely not be needed several years. Without the billbugs, the turfgrass would be vigorous and weeds would likely not be a problem.

The previous example is only one in a long list of cases where our one-at-a-time, separate-and-independent management philosophy lacks efficiency. For instance, notable increases in the severity of rhizoctonia have been associated with mole cricket infestation in the South. Root-feeding insects may also compromise the ability of plants to outgrow the symptoms of foliar diseases. Although above-ground feeding insects like cutworms and armyworms can also affect plant performance, grasses are generally well-adapted to the periodic removal of above-ground tissues.

Due to a number of adaptations, including placement of the meristematic zone close to the soil surface and storage of nutrient reserves in underground tissues, grasses can quickly replace foliage as long as basic resources are available. Root-feeding insects, however, impose a different suite of pressures on plants that may have more serious effects than leaf feeding. Root-feeding insects can influence plant growth, biomass production and nutrient status, and may alter the nutrient profile of the rhizosphere. As a result, proper management of root-feeding insects can have dramatic effects on overall turfgrass quality. Keep in mind that these out-of-sight, out-of-mind insects are easy to overlook. It's important to understand that other pest management concerns, such as weeds and diseases, may be more closely linked to their presence than commonly recognized.

Richmond is a post-doctoral researcher in the Department of Entomology at The Ohio State University.

REFERENCES

- Brandenburg, R. L. and M. G. Villani. 1995. *Handbook of turfgrass insect pests*. The Entomological Society of America, Annapolis, Md.
- Richmond, D. S., H. D. Niemczyk and D. J. Shetlar. 2000. "Overseeding endophytic perennial ryegrass into stands of Kentucky bluegrass to manage bluegrass billbug (Coleoptera: Curculionidae)." *Journal of Economic Entomology* 93(6): 1662-1668.

TURFGRASS TRENDS**SECTION STAFF****Managing Editor**

Curt Harler
440-238-4556; 440-238-4116 (fax)
curl@curtharler.com

Golfdom Staff Contact

Frank H. Andorka Jr.
440-891-2708; 440-891-2675 (fax)
fandorka@advanstar.com

Online Editor

Lynne Brakeman
440-826-2869; 440-891-2675 (fax)
lbrakeman@advanstar.com

Chief Science Editor

Dr. Karl Danneberger
614-292-8491; 614-292-3505 (fax)
danneberger.1@osu.edu

Production Manager

Jill Hood
218-723-9129; 218-723-9223 (fax)
jhood@advanstar.com

Art Director

Lisa Lehman
440-891-2785; 440-891-2675 (fax)
llehman@advanstar.com

Publisher

Patrick Jones
440-891-2686; 440-891-2675 (fax)
pjones@advanstar.com

Group Publisher

Tony D'Avino
440-891-2640; 440-891-2675 (fax)
tdavino@advanstar.com

Corporate & Editorial Office

7500 Old Oak Blvd.

Cleveland, OH 44130-3369

FIELD ADVISORS

Rob Anthony
Southern Methodist University

J. Douglas Barberry
Turf Producers International
Agronomist

F. Dan Dinelli
North Shore CC

Merrill J. Frank
Columbia CC

Michael Heacock
Pacific Golf Management K. K.

Paul B. Latshaw
Muirfield Village CC

Kevin Morris
National Turfgrass Evaluation
Program

Sean Remington
Green Valley CC

Ken Schwark
Roddy Ranch GC

Matt Shaffer
Merion GC

Wayne Norman
The Scotts Co.

Eric Kalasz
Bayer Environmental Sciences

David Irmens
The Andersons

Chris Byrd
Milliken

Van Cline
The Toro Co.

EDITORIAL REVIEW BOARD

Dr. A.J. Powell
University of Kentucky

Dr. Eliot C. Roberts
Rosehall Associates

Dr. Gerald Horst
University of Nebraska

Dr. Eric Nelson
Cornell University

Dr. Richard Hull
University of Rhode Island

Dr. Vic Gibeault
University of California

Dr. Pat Vittum
University of Massachusetts

Dr. Rick Brandenburg
NC State University

CONTACT US:

Editorial: 440-238-4556

Web site: www.turfgrasstrends.com