

Biology and Management of the Annual Bluegrass Weevil



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Introduction

The annual bluegrass weevil (ABW) is a beetle of the weevil family and a pest of short-cut, highly-maintained turf in the Northeastern and Mid-Atlantic regions. The current scientific name of ABW is *Listronotus maculicollis*, though it was formerly considered to be a species of *Hyperodes*.

The ABW has recently been found in Maryland. It is also known in Canada, Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, New York, New Jersey and Pennsylvania. It has been estimated that golf courses in the New England region spend over \$6,000 annually, using five or six insecticide applications per year to manage this pest.

It was believed for years that the destructive ability of ABW was restricted to annual bluegrass and that ABW was isolated to the northeastern states. Recent research and field observations have shown that ABW also may cause substantial damage to creeping bentgrass fairways and putting green collars in the Mid-Atlantic region.

Description, Biology and Seasonal Activity

The ABW has a complete life cycle with 1-2 generations per year. Although the adults appear reddish when they emerge from the pupal stage, they are typically black or gray, nearly 1/8" long with the characteristic weevil snout. The body of the adult is covered with fine hairs and scales, which are easily observed under magnification. The sexes are difficult to distinguish.

The eggs of ABW are small and oblong, and can be found in leaf sheaths of the grass plant. Larvae are legless, with a white body and dark brown head. The older larvae are slightly curved but not as C-shaped as many white grubs. Pupae of the ABW are similar to the adults, but smaller in size and typically reddish-brown. Weevils over-winter mainly as adults in litter under pine trees and clippings deposited in roughs along the sides of fairways. They begin to migrate from the fine turf areas to these sites in early autumn.

Migration of adults back to fine turf areas begins in early spring (mid-April in southern New York) when the young adults are often seen walking across turf. Adult feeding, which causes little damage, occurs during the day.

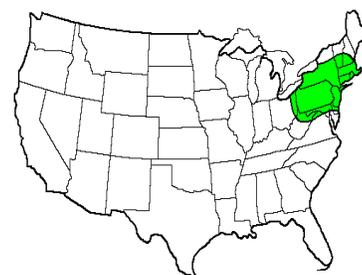
At about the same time that adults begin to feed they also deposit eggs in leaf sheaths. Eggs are laid in groups of 2-3 and each female can have 11 offspring. Larval formation takes about a month and development from egg to adult takes about 2 months.



Adult Annual Bluegrass Weevil
Photo courtesy of Watschke et al. 1995



Weevil Larvae in thatch of Bentgrass
Photo courtesy of Darin Bevard



Distribution of ABW; wider spread is likely.
Photo courtesy of Dr. David Shetlar

KEY POINTS

Annual bluegrass weevil is a pest of annual bluegrass and creeping bentgrass.

One or two generations of annual bluegrass weevil are possible.

The larvae are responsible for most turf damage; adults cause little harm.

Damage and Symptoms

Damage often is first observed at the edges of greens and fairways with a high proportion of annual bluegrass (*Poa annua*). Most damage is caused by larvae, which may go unnoticed for many weeks. Damage begins when adult females chew into the sheaths of grass blades and lay eggs underneath. Although this may weaken and yellow the turf, it rarely causes death.

The young larvae first feed inside grass stems, and later on crown tissue. As more eggs hatch, the extent of the damage increases. The damage caused by the final growth stages of ABW is usually the most destructive. At this point, the turf will appear to be under severe drought stress due to damaged stems; it often appears purple before it turns brown and dies-out.

Significant damage from first generation ABW generally becomes obvious in late May or early June, and often is mistaken for other problems. Damage from second generation ABW occurs in late July until early August.

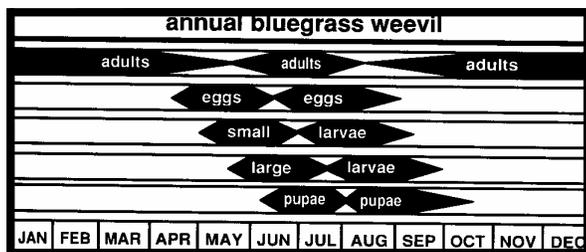
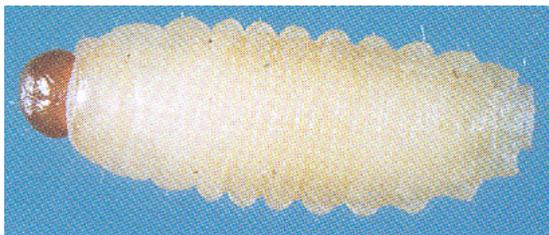


Photo of typical larva and chart showing life stages of ABW. From Brandenburg et. al. 1995

Monitoring and Thresholds

The stems of damaged turf can easily be pulled away from the crowns; hollowed stems with sawdust-like frass (excrement) is a key diagnostic feature. Older larvae may be detected by cutting into the turf and examining the area between turf and thatch. The early-season damage threshold is 30-80 larvae per square foot, which decreases as turf is stressed (1).

Monitoring also can be done by flushing the turf with a solution of dishwashing detergent (1/2 oz detergent per gallon water) to force adults to the surface. Black light traps are also used to attract and count adults (2).

Management and Control Options

Cultural management options include proper nutrition and irrigation, which often helps mask symptoms of ABW damage. Converting from a susceptible turf species to one that is tolerant to ABW is also an effective management strategy. In Maryland, perennial ryegrass is resistant to ABW. Because ABW overwinters in pine litter and leaves, removing this material may help to reduce populations.

Few natural enemies to ABW are known. Biological control has been achieved with late spring applications of a parasitic nematode (*Steinernema carpocapsae*) as well as the fungus *Beauveria bassiana*. Studies with wasps (*Microctonus aethiopoies* and *M. hyperodae*) that parasitize ABW have provided minimal control.

At this time, controlling ABW with insecticides seems to be the most effective strategy. Although spot-treating areas with high populations of adults or previous ABW infestations is effective, the insecticides must be applied while adults are active in the early spring, i.e. before eggs are laid and before damage is seen.

Insecticides are typically applied when adult ABW are seen walking across turf areas, or about the time that flowering dogwood trees bloom. A follow-up application in July may be needed to control a second generation.

Pyrethroid insecticides currently labeled for control of ABW adults include deltamethrin (Deltagard[®]), bifenthrin (Talstar[®]), cyfluthrin (Tempo[®]), and lambda-cyhalothrin (Battle[®], Scimitar[®]). These products generally provide over 85% control.

For preventive ABW control in chronically infested sites, a long residual insecticide such as imidacloprid (Merit[®]) or halofenozide (MACH2[®]) should be applied before egg hatch to control larvae. However, these chemicals typically only reduce populations by 40-60%.

Long-residual, preventatively-applied insecticides used for white grub control often provide less control of ABW than the curatively-applied pyrethroids that target adults. Since water dilution rates, rainfall, mowing and other factors affect control, it is important to follow insecticide label instructions.

References

1. Rothwell, N., and P.J.Vittum. 2003. The annual bluegrass weevil: A little weevil causing big problems in the Northeast. USGA Green Section Record. Vol. 41 (1): 6-7.
2. Vittum, P.J., M.G.Villani, and H. Tashiro. 1999. *Turfgrass Insects of the United States and Canada*, 2nd ed. Cornell University Press, NY. 422pp.

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