Distribution of Billbug Species and Their Seasonal Life Cycles on Idaho Golf Courses

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Objectives:

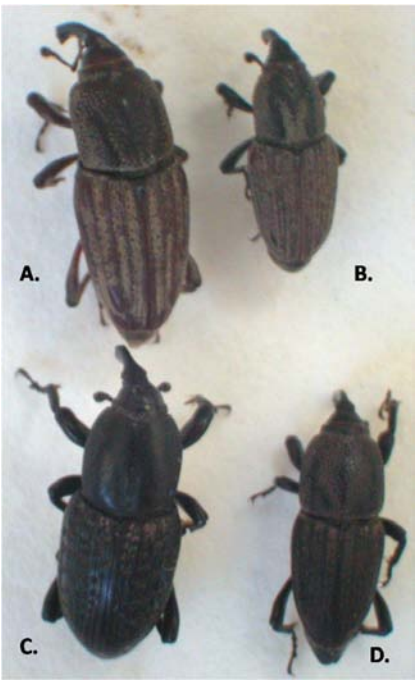
1. Identify billbug species present in Idaho.
2. Identify billbug life cycle seasonality in Idaho in order to optimize insecticide application timings.

Start Date: 2007
Project Duration: two years
Total Funding: $6,000

Billbug damage is an increasing problem on southern Idaho golf courses and home lawns. Three species, bluegrass (*Sphenophorus parvulus*), hunting (*S. venatus*) and Rocky Mountain (*S. cicatristriatus*) have been reported as being damaging to turfgrass in the Pacific Northwest. Except for the bluegrass billbug, the distribution and biology of these species are not completely understood. Additionally, Idaho's diverse landscape provides large environmental differences that can influence the distribution and life cycle of these species. Understanding the biology and life cycle of these species will optimize insecticide choice and timing for effective billbug control.

Linear pitfall traps were placed at 12 locations throughout southern and central Idaho. Locations included golf courses, home lawns, one business lawn, and roadside park lawn. Turfgrass composition at most trap locations was a mix of Kentucky bluegrass and annual bluegrass. Most golf courses monitored are over 50 years old except for SpurWing and the Valley Club, which were built in 1996. All traps were monitored weekly for adult billbug activity and cores were taken to evaluate larvae occurrence at three locations. Weekly soil samples for larvae occurrence were taken using a 4-inch diameter cup cutter to remove 10 cores per site.

Linear pitfall trap used to monitor weekly adult billbug activity.



Adult billbug species collected from linear pitfall traps in Idaho during 2007: A) Hunting, B) Phoenicians, C) Rocky Mountain, and D) Bluegrass.

Monitoring results confirmed the presence of bluegrass, Rocky Mountain, and hunting billbug species in the Treasure Valley and Twin Falls location. In addition to these three species, we identified the presence of Phoenician billbug (S. phoeniciensis), which had previously not been known to occur on cool-season turf. Bluegrass species comprised 27 to 75% of all adults collected, while Rocky Mountain, hunting and Phoenician ranged from 2 - 37%, 0 - 46%, and 0 - 24%, respectively. Only 4 adults were collected at SpurWing CC. However, in the fall of 2006, 38 adults were collected in late September. Of these adults, 18% were bluegrass, 55% Rocky Mountain, and 26% hunting billbug.

In eastern Idaho and central Idaho locations (Blaine and Twin Falls counties), only bluegrass and Rocky Mountain were found. Bluegrass species ranged from 38 - 100% of the adults collected while Rocky Mountain ranged from 0- 62%. Elevation differences between the Treasure Valley and the eastern/central Idaho locations are believed to have a large impact on the observed species distribution. The higher elevations and hence fewer growing degree-days may inhibit the movement or survivability of hunting and Phoenician species in these areas.

Sampling in the Treasure Valley and eastern Idaho revealed the presence of larvae in April prior to adult activity. This confirms previous reports on the over-wintering capability of larvae possibly due to the reported prolonged oviposition period of Rocky Mountain and hunting billbug species. In 2006 and 2007 sampling of eastern Idaho locations where Rocky Mountain billbug dominated the species complex, relatively large larvae populations were observed in late October.

This prolonged oviposition period makes control more difficult as surviving over-wintering larvae are generally larger, deeper in the soil, and more difficult to control using preventative control tactics the following spring. Applications of systemic insecticides applied at or just prior to peak adult activity have been shown effective in reducing larvae damage. However, where over-wintering larvae are present, such applications may be ineffective in controlling these over-wintering larvae.

Summary Points

- Confirmed the presence of bluegrass, hunting and Rocky Mountain billbug species in the Treasure Valley.
- Identified the presence of Phoenicians billbug species in the Treasure Valley.
- Adult activity peaks at around mid-May in the Treasure Valley and early to mid-June in eastern Idaho.
- Only bluegrass and Rocky Mountain species found in eastern Idaho.
- Identified over-wintering larvae in Treasure Valley and eastern Idaho.
- Identified large population of larvae late in the season in eastern Idaho.