

ANNUAL BLUEGRASS WEEVIL: FUTURE PEST IN MICHIGAN?

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The annual bluegrass weevil (ABW), *Listronotus maculicollis* (Dietz) (Coleoptera: Curculionidae), is a serious pest of golf course turf in the Northeastern United States. The weevil is known to damage highly maintained turf in this region. Golf course superintendents are estimated to spend over \$6,000 per year to manage these pests at acceptable levels. Since little information is currently available concerning this pest, we can only look to our current ongoing research to speculate if ABW will become a pest of Michigan golf courses.

At the University of Massachusetts, we have investigated many aspects of this insect to better understand its biology and natural history. We are currently working on a degree-day model for ABW. We hope an accurate model will provide golf course superintendents with a method of control for this turfgrass pest that is more economically feasible and environmentally friendly, as well as less labor intensive than traditional control methods.

Golf course superintendents and researchers in the Northeast have observed ABW to feed preferentially on *Poa annua* on golf courses, but no empirical data exist to support these observations. We conducted experiments on a golf course in New York state to verify this feeding preference theory. We constructed five plots of commonly planted cool season turfgrasses behind a green adjacent to weevil overwintering sites: *P. annua*, creeping bentgrass variety L93, creeping bentgrass variety 3-way (L93, Southshore, Penncross), Kentucky bluegrass, and a Kentucky bluegrass/perennial ryegrass mixture. All grasses were mowed to optimum growing heights. In 2000, we found weevils preferred the shorter mowed grasses – L93, 3-way, and *P. annua*. However, unlike previous observations, there were no significant differences in preference between *P. annua* and the creeping bentgrass varieties.

In the year 2001, we did find significant differences between the shorter mowed grasses; we found highest numbers of ABW larvae in *P. annua* plots. We also had high numbers of larvae in the creeping bentgrasses, but very few larvae were found in the Kentucky bluegrass or Kentucky bluegrass/perennial ryegrass mixture. On a different hole, we set up the same five different grass plots, but we divided each plot and mowed one half of the grass type at 0.5 in. and the remaining half was mowed to 1.5 in. Overall, we found the highest numbers of larvae in combined short and long *P. annua* plots, and ABW larval numbers were significantly higher in those plots mowed at 0.5 in. However, we found more larvae in 3-way bentgrass plots mowed to 0.5 in. than in the *P. annua* plots mowed at 1.5 in. These data suggest that ABW larvae will feed first and foremost on short mowed grasses. These insects will choose feeding sites secondarily based on grass type.

We also tested five different varieties of creeping bentgrasses on a three-year old golf course in Rockland County, NY, which had very little *P. annua* present: 3-way, L93, Southshore, Penncross, and Penntrio. Three-way bentgrass had significantly more ABW larvae than the remaining bentgrasses. The L93 plots also had damaging levels of larvae, but the other grasses had extremely low numbers. This experiment is further proof that ABW will feed on short mowed bentgrass as well as *P. annua* on golf course turf.

Little information is also available concerning the distribution of these insects across golf course turf. Superintendents have observed ABW larval feeding damage to be heaviest around the perimeters of fairways. We monitored adult weevil population numbers and locations from April 27 to October 1, 2001. We found adults to be distributed equally across the golf course at all times of the year. Larval sampling was done for the first generation, and the numbers were evenly distributed across the fairway as well. There was no correlation between location of adults and location of first generation larvae. Significant peak second-generation adult emergence was noted in the last week of June, but no subsequent second-generation larvae were found in the sampling area when we sampled five weeks later.

Currently, no documentation exists on the behavioral, ecological, and physiological aspects of this insect. We have provided basic knowledge on this turfgrass pest: 1) reproductive seasonality of male and female adult weevils, 2) insemination levels of female weevils throughout the year, and 3) diapause (hibernation habits) of adult weevils.

All data collected has provided a better understanding of an insect species about which little is understood. However, at this time, we are not able to predict whether this turfgrass pest will invade Michigan. This weevil has historically damaged golf courses located in the metropolitan New York area, particularly Long Island and Westchester County, New York, and Fairfield County, Connecticut. However, in recent years, reports of *L. maculicollis* damage have been received from many states in New England: Massachusetts, Vermont, New Hampshire, Rhode Island, and northern Connecticut, as well as several locations in Pennsylvania and Northern New Jersey. Non-damaging ABW populations have been reported in more than 30 states in the U.S., but damaging populations remain only in the Northeastern U.S. The potential for ABW to become a golf course pest in Michigan is likely based on the state's similar climate and grass type to that of its eastern counterparts, but thus far, this insect seems to be happy living in the Northeast.