

# Kentucky Bluegrass Cultivar Response to Bluegrass Billbug, *Sphenophorus parvulus* Gyllenhal<sup>1</sup>

D.T. Lindgren, R.C. Shearman, A.H. Bruneau, and D.M. Schaaf<sup>2</sup>

Department of Horticulture, University of Nebraska, Lincoln, NE 68583

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**Abstract.** A trial of 38 cultivars of Kentucky bluegrass (*Poa pratensis* L.) demonstrated genetic differences to an infestation of bluegrass billbug. The correlation coefficient between injury ratings and billbug larval density in sod samples was  $r = 0.73$ . Thatch accumulation was not significantly correlated ( $r = 0.31$ ) with billbug density.

The larvae of bluegrass billbug, widely distributed throughout Nebraska and the Great Plains region, destroy the root systems of Kentucky bluegrass turfs. Most visual injury symptoms occur from late-June to August, when bluegrass lawns are exposed to heat and drought stress (2).

A severe, natural billbug infestation occurred in a Kentucky bluegrass cultivar trial at the University of Nebraska-North Platte Station in 1979. The original trial was established from seed in May, 1977 and included 38 cultivars, replicated 4 times in a randomized complete block design. Soil on the site was a Cozad silt-loam (*Typic haplustoll*). Fertilizer (18.0 N—7.7 P—5.0 K) was applied during seedbed preparation at 5 g m<sup>-2</sup> N. Nitrogen fertilizer was applied in 1977 and 1978 at 5 g m<sup>-2</sup> in early-July, September and late-October, and once in 1979 in early-May. Turfs were mowed in the spring and fall at 5.0 cm and at 7.5 cm during the summer as needed and were irrigated with 2.5 cm of water weekly to prevent visual drought stress. Herbicides or fungicides were applied to the treatment area.

Billbug injury was first observed in late June of 1979 and cultivars were rated by 3 individuals for visual injury on July 5, 1979 using a scale of 1 (no injury) to 9 (all plants injured). Billbug larval density was determined by counting larvae from a sod sample (17.8 cm wide x 17.8 cm long x 10.0 cm deep) taken from the center of each plot located in replicates 2 and 3.

All cultivars showed some visual injury (Fig. 1). Injury ratings averaged from a high of 8.2 for 'Rugby' to a low of

1.2 for 'Arista'. 'Park' was chosen as the standard cultivar for statistical comparisons due to its low mean billbug larval number per sample in a previously reported study (1). Larvae varied from a high of 62 in 'Sydsport' to a low of 6 in 'South Dakota Certified' and 'Delta'. Injury rating and billbug density were correlated at the 5% level ( $r = 0.73$ ). With this correlation, one would anticipate low injury with low billbug larval number and high injury with high billbug larval number. The correlation coefficient between billbug density and thatch accumulation ( $r = 0.31$ ) indicated that thatch ac-

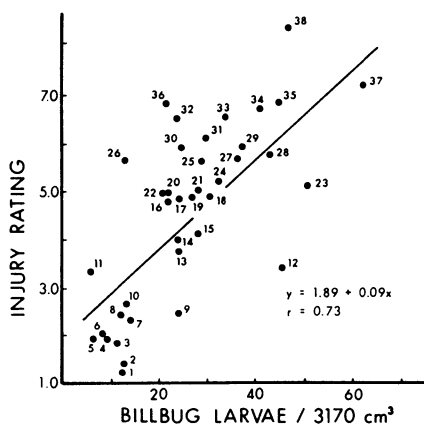


Fig. 1. Relation between injury ratings (LSD 5% = 1.9) and billbug larval density (LSD 5% = 6.7) in sod samples of 38 Kentucky bluegrass cultivars. Numbers by dots correspond to cultivars listed.

1 = Arista	14 = A-20-6	27 = Benson
2 = Arboretum	15 = Birka	28 = Majestic
3 = Nu Dwarf	16 = Pennstar	29 = Parade
4 = Geary	17 = Baron	30 = Merit
5 = Delta	18 = A-29-10	31 = Glade
6 = S-21	19 = Vantage	32 = Fanfare
7 = Park	20 = Ram I	33 = Galaxy
8 = Aquila	21 = Wabash	34 = Bristol
9 = K1-157	22 = Windsor	35 = Banff
10 = Nuggett	23 = Adelphi	36 = Newport
11 = South Dakota	24 = Victa	37 = Sydsport
12 = Touchdown	25 = Merion	38 = Rugby
13 = K1-189	26 = Fylking	

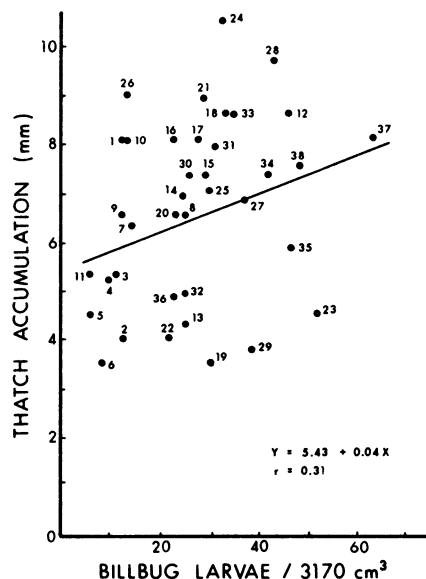


Fig. 2. Relation between thatch accumulation and billbug larval density in sod samples of 38 Kentucky bluegrass cultivars. Numbers correspond to cultivars listed under Fig. 1.

cumulation was not a factor influencing billbug density in this study (Fig. 2).

The results of this study are consistent with those reported in a 1974 Nebraska study (1) with few exceptions. The 1974 study included 15 cultivars, 9 of which were included in this study. In both studies 'Park', 'South Dakota Certified', 'Nu Dwarf', 'Delta', 'Merion' and 'Pennstar' responded similarly to billbug infestation and injury. Although 'Fylking' had low mean billbug numbers in both studies, injury rating was higher in this study than in the 1974 study. While 'Nuggett' had a low billbug infestation and injury rating in this study, it had the most billbug larvae and greatest injury in the 1974 study. Location and growing conditions (i.e. soil type, soil pH, daily temperature extremes, and relative humidity) differed between the study sites. Therefore, the general agreement in cultivar response suggests a genetic basis for the differential response to the insect. Those cultivars with low injury ratings and either low or high billbug larval density offer a potential for breeding or selecting resistant or tolerant cultivars.

## Literature Cited

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<sup>2</sup>Assistant Professor, Associate Professor, Integrated Pest Management Specialist-Turf, and Graduate Student, respectively.