KENTUCKY RESEARCH REVEALS GREENBUG TURFGRASS PREFERENCES

By D.W. Jackson, K.J. Vessels, and D.A. Potter, department of Entomology, University of Kentucky, Lexington, KY.

The greenbug, Schizaphis graminum (Rondani), has become an important problem of the turf industry within the last 10 years (1). Although this aphid is well studied as a pest of sorghum and small grains, little is known about its biology or habits on turfgrass. Many important questions concerning the aphid's overwintering site, its feeding preferences, and its reasons for attacking only certain lawns remain unanswered.

Damage

Greenbug feeding injury on turfgrass foliage shows up as yellow or rust-colored spots with necrotic centers, caused by toxic secretions injected into the plant tissue and from withdrawal of chlorophyll at the feeding sites. Translocation of the aphid's salivary toxins within the plant may also weaken the root system. Heavily infested turf may harbor 5,000 or more aphids per square foot, and will develop a characteristic rust color and finally turn brown (2). Greenbug damage nearly always begins around the base of trees, but often spreads into sunny areas as well. Our observations indicate that injury on home lawns is most severe in areas that are under moisture stress, while low-lying areas are less likely to be affected.

Research

In research at the University of Kentucky, we studied the feeding preferences, survival, and reproductive rate of greenbugs on nine common cool and warm season turfgrasses. We also tested the aphid's ability to survive on nine frequently encountered lawn and roadside weed species. Results showed that 'Kenblue,' 'Vantage,' and 'Adelphi,' the three Kentucky bluegrass cultivars tested, were all highly suitable hosts for the greenbug. Since these cultivars differ widely with respect to both their genetic and morphological characteristics, it is doubtful that existing Kentucky bluegrass cultivars with appreciable levels of resistance will be found. Although previous reports of greenbug activities on turf suggest that the aphid will feed and reproduce only on Kentucky bluegrass, we found that both 'Ky 31' tall fescue and 'Jamestown' chewings fescue will support rapid aphid buildups in the greenhouse. Aphids did not survive or reproduce on ryegrass, bentgrass, zoysiagrass, or bermudagrass.

The following weed species were screened as potential alternative hosts for the greenbug:

- Common dandelion Taraxacum officinale (Weber)
- Broadleaf plantain Plantago major L.
- Buckthorn plantain P. lanceolata L.
- Ground ivy Galeochoma hederacea L.
- Pigweed Amaranthus sp.
- Wild strawberry Duchesnea indica (Andr.) Focke
- Large crabgrass Digitaria sanguinalis L.
- Violet Viola sp.
- Yellow wood sorrel Oxalis stricta L.

In our studies, greenbugs failed to survive or reproduce on any of the nine grassy or broad-leaved weeds tested, suggesting that these plants do not serve as reservoirs from which greenbugs could reinfest a lawn.

Future Research

The recent alarming increase in greenbug outbreaks on home lawns suggests that this insect may have developed a new association with turfgrasses. Although it is possible that a new greenbug biotype or strain has evolved which prefers turfgrass over other hosts, there is evidence that certain high maintenance practices, such as overuse of insecticides and fertilizers, may be changing the physiology of the turfgrass habitat so as to make it more suitable for the greenbug. Observations during the 1979-1980 seasons indicate that greenbug outbreaks nearly always occur on well maintained, intensively managed lawns. It is apparent that additional research pertaining to the effects of lawn chemicals and high maintenance programs on greenbug popula-

Continues on page 57

Although greenbug injury generally appears first in shaded areas under trees, heavy infestations may severely damage an entire lawn.

Patches of healthy grass in greenbug infested bluegrass lawns indicate the potential for resistant turfgrass species.
Greenburg from page 55

tions will provide important information for the turf industry. Discovery of the greenbug's overwintering site may reveal a weak link in the aphid's life cycle that is vulnerable to control. The possibility that greenbug damage can be minimized by cultural practices such as timely irrigation, seeding with resistant lawn grasses, or use of a bagging mower should also be investigated.

Literature Cited

Weed Control from page 21

bined to provide a broader spectrum of control plus this combination has the advantage of using dicamba at a lower rate than when it is used alone. This combination should be applied at the rate of 1.0 pound ai/A, 2,4-D + 0.5 pound ai/A MCPP + 0.10 pound ai/A dicamba. Fall and spring are the best times for control with early fall being preferred especially when turf stands are contaminated with later germinating summer annuals (particularly spurgs and Oxalis).

Some broadleaf weeds require more specific treatment. Creeping speedwell (Veronica filliformis) can be controlled with DCPA 75 W applied in May at 12 pounds ai/A. The granular formulation is not effective. Control using the 75 W often takes as long as three to four weeks to occur. Once the chemical begins to work, the level of control should be nearly 100 percent. DCPA 75 W is not currently recommended for control of any other speedwells.

Oxalis and wild violet are also difficult to control since silvex cannot be used. The combination of 2,4-D and 2,4-DP at 1.0 pound of ai/A from each has provided good control of Oxalis. Wild violet control from this combination is not as good as for Oxalis. Spring application is the best time of the year for wild violet control.

Regardless of the broadleaf weed control approach being used, treatments should be made only when soil moisture is adequate to support vigorous weed growth. Avoid spray drift onto sensitive plants, clean equipment properly after application, and dispose of empty pesticide containers in an approved manner.

---

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>&quot;APPARENT&quot; EROSION RATE (Soil Loss)</th>
<th>Equivalent Tons/Acres/Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONWED HYDRO MULCH 2000 FIBERS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mulch applied at 1600 pounds per acre</td>
<td>0.14</td>
<td>2.35</td>
</tr>
<tr>
<td>AVERAGE OF OTHER MULCHES</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mulch applied at 1600 pounds per acre</td>
<td>0.96</td>
<td>16.08</td>
</tr>
<tr>
<td>BARE SOIL (control plot)</td>
<td>1.99</td>
<td>33.34</td>
</tr>
</tbody>
</table>

*Testing was done on a 2:1 slope. After soil preparation, the plots were seeded and mulched in one operation and allowed to lay overnight. Simulated rain controlled at the rate of four inches per hour was applied until a targeted deterioration of the surface occurred. Product effectiveness was evaluated by "apparent" rate of erosion which was calculated by dividing the total time until deterioration by the weight of the material eroded.

This natural wood fiber mulch is premixed with a highly effective soil stabilizing tackifier for convenient one-step application. It's ideal for hydraulic seeding everything from front lawns to strip mines. And, once it's down, Hydro Mulch 2000 fiber enhances germination by protecting seeds from temperature fluctuations and evaporation of soil moisture.

So, when your reputation is riding on each job, use Conwed Hydro Mulch 2000 fiber, for a job that's done right the first time.

For information, write Conwed Corporation, Fibers Division, 444 Cedar Street, P.O. Box 43237, St. Paul, Minnesota 55164. Or phone (612) 221-1190.

---

CONWED
innovative products for better environments
Write 111 on reader service card
MARCH 1981/WEEDS TREES & TURF 57