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TURFGRASS RESEARCH REVIEW

Controls of potentially serious pests

Changes in billbug and chafer controls. *H. Tashiro and K.E. Personius. 1970. New York Turfgrass Assn. Bulletin 86. pp. 333-336. (from the New York State Agricultural Experiment Station, Geneva and the Monroe County Cooperative Extension Assn., Rochester, New York, respectively).*

The authors investigated the habits and control of the bluegrass billbug and European chafer over a period of two years. These two insects have become major turfgrass pests in the Rochester, N.Y., area during the last three years.

Bluegrass billbug damage to Kentucky bluegrass turfs was severe during 1969. The adults were particularly active during the latter part of June with feeding punctures evident on approximately 20 per cent of the Kentucky bluegrass stems examined. The overwintering adults lay their eggs in early June. Larvae of the new generation appear in the soil by the last week in June.

The bluegrass billbug control studies involved an evaluation of (a) various types of insecticides and (b) the proper timing of insecticide applications for most effective control. Insecticides evaluated included Baygon, carbaryl, diazinon and Dursban. Effective control of the bluegrass billbug was obtained with all four insecticides. Rate of application studies revealed that adequate control could be achieved with one ounce of active ingredient per 1,000 square feet of Baygon and diazinon or 1.5 ounces of carbaryl per 1,000 square feet.

Proper timing of the insecticide applications was particularly important in achieving effective control of the bluegrass billbug. A general guideline proposed by the authors is that an insecticide should be applied when 10 to 15 adult bluegrass billbugs can be collected on a hard surface area during a five minute period of warm, sunny weather. Best control was achieved during the peak activity period of the overwintering adults. This occurred during late June and early July under Rochester conditions. An annual insecticide application made in mid-June gave season-long insect control.

Historically, an application of chlordane, dieldrin or heptachlor applied once every four to six years provided adequate European chafer control. The recent ineffectiveness of these insecticides in controlling this insect resulted in the discovery of a European chafer strain which was highly resistant to the standard soil insecticides. Insecticide studies similar to those conducted on the bluegrass billbug revealed that both diazinon and Dursban provided adequate control of the resistant European chafer strain. On the other hand, carbaryl was not consistent in providing adequate control, primarily because of the critical timing required. Baygon did not provide acceptable control.

The adult European chafer is in peak flight activity during late June and early July. Egg hatching occurs primarily during late July and early August. The hatching period and very young, first instar stage are the most desirable times for control measures to be practiced.

The authors indicated that where both the bluegrass billbug and resistant European chafer strain are a problem, the insecticide used should possess some residual activity for controlling both turfgrass pests in a single application. Diazinon is quite effective whereas carbaryl lacks sufficient residual activity. The authors predict that damage to Kentucky bluegrass turfs caused by the bluegrass billbug and the resistant European chafer strain will spread to other areas.

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Comments: The bluegrass billbug and European chafer have not been as serious a problem on bluegrass turfs as other "grub type" insects, such as the June beetle and Japanese beetle. However, they have become a serious problem on turfs in certain areas and may become a more widespread reoccurring problem.

The bluegrass billbug is a hard-shelled beetle and has a long snout or bill with a set of chewing mouth parts at the tip. The larvae are legless, 0.4 to 0.7 inch long and white with a yellowish-brown to reddish-brown head. The billbug larvae feed primarily on the roots and rhizomes of the grass plant whereas the adult feeds on grass stems near the soil surface. Punctures of the stem and crown are commonly observed. The larvae may also burrow directly into the stem. Visible injury appears as irregularly shaped, brown patches. This insect prefers moist areas.

The European chafer damages turfs primarily as a result of the root and rhizome feeding of the larvae. The adult beetle causes little damage because of its minimal feeding activity. This insect has a one year life cycle. The adults are approximately 0.5 inch long and have a light-tan to chocolate-brown color. The adults are characterized by a distinctive buzzing noise during active flight in June and July. Injury to turfs generally appears as irregularly shaped brown patches. A more detailed examination reveals the lack of a root system.

Most professional turfmen are probably not as acquainted with these two turfgrass insects as with some of the more commonly occurring species. However, these two insects can cause severe damage to turfs and may become a more widespread problem in the future. Each professional turfman, particularly in the Northeast and Midwest, should become acquainted with these two turfgrass insect pests so that he can readily identify them and take immediate corrective procedures before serious damage to turfs occurs.

The effect of two preemergence herbicides on the rooting and establishment of 'Tifgreen' and 'Tifway' bermudagrass. *M. T. Ayer. 1970. Proceedings of the Florida Turfgrass Management Confer-*

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ence. 18:106-108. (from the Department of Ornamental Horticulture, University of Florida, Gainesville, Fla. 32603).

The objective of this study was to determine the effect of two preemergence herbicides on the root and shoot establishment of bermudagrass. The herbicides used were: (a) granular bensulide applied at 15 and 30 pounds of active ingredient per acre, (b) granular benefin applied at three and six pounds of active ingredient per acre, and (c) an untreated check. The granular herbicides were mixed with 25 grams of dry soil and spread over the surface of the soil. The herbicides were applied to two bermudagrass (*Cynodon* sp.) cultivars: (a) Tifgreen and (b) Tifway. Two six-inch bermudagrass stolons of comparable uniformity were established in large pots, 15 inches in diameter and six inches deep.

The treatments were arranged in a randomized block design with four replications. The data taken included a visual rating of per cent vegetative cover made 35 days after planting. Clippings were collected at 10 day intervals from the 30th through 60th day. The experiment was terminated 75 days after planting, the soil washed from the root system in the pots, and measurements made of root depth, density and total dry weight.

The results showed no detrimental effect on the shoot growth of Tifgreen and Tifway bermudagrass from the application of benefin and bensulide at two rates. In contrast, significant root damage was observed on Tifway from both herbicides, each applied at two rates. The root system of Tifgreen bermudagrass was also damaged by both rates of bensulide and the higher rate of benefin. Thus, a varietal difference in preemergence herbicide tolerance was noted within the bermudagrass species.

Comments: Benefin and bensulide have been effective in controlling annual bluegrass (*Poa annua*) in bermudagrass turfs. Both herbicides are recommended for use on established turfs only. No phytotoxicity was visually apparent in studies with established turfs where shoot density and turfgrass quality were the primary criteria. This establishment study suggests that these two turfgrass herbicides can be potentially harmful to the root system of bermudagrass, particularly at the higher rates.

Recent research indicates that a number of herbicides can cause serious damage to the meristematic areas of the root system. Should this occur, there is usually no visible evidence in terms of immediate effects on above ground turfgrass quality. However, should the turf be subjected to stress conditions, particularly moisture stress or intense traffic, the proneness of the turf to serious damage would be increased substantially. In addition, the recuperative potential is decreased.

In the past, the urgent need for effective herbicides to control some of the serious turfgrass weeds limited selectivity evaluations primarily to above ground visual observations. This situation is changing with the increase in turfgrass research among the state agricultural experiment stations. More detailed, long term studies are revealing some of the subtle, less easily measured effects such as root phytotoxicity. No doubt future evaluations of turfgrass herbicide selectivity will involve a more comprehensive characterization. □