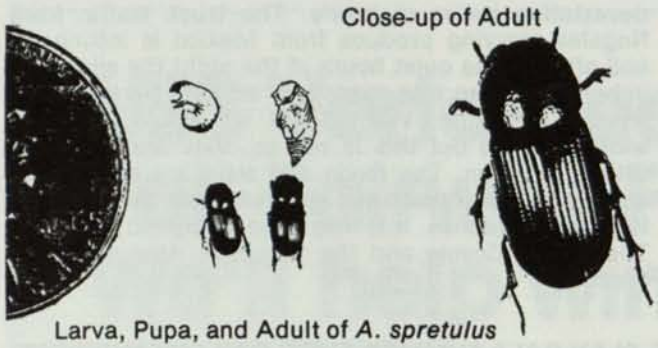

Larva, Pupa, and Adult of *A. spretulus*

EVALUATION OF INSECTICIDES FOR CONTROL OF ADULT Ataenius spretulus IN GOLF COURSE FAIRWAYS

Drs. Harry Niemczyk and Louis Vasvary[1/]

The objective of a program for control of adult **Ataenius spretulus** is to kill the beetles before they lay their eggs and thereby prevent the development of a larval infestation. The optimal time to apply the insecticides in such a program is when the adults start depositing their eggs (Fig. 1). Insecticide applications made at this time immediately kill the adults on the fairway and residue from the insecticide continues killing them for some time as they fly onto the fairway.

Bioassay experiments conducted in 1975 with the bluegrass billbug adult, **Sphenophorus parvulus**, indicated that the residual from a single application of 6 lb. AI/A diazinon may be sufficient to control adult **Ataenius**. Similar experiments with chlorpyrifos (Dursban®) at rates from 1 to 4 lb. AI/A showed the higher rates may also give control. Both diazinon and chlorpyrifos are labeled and effective for control of the "turfgrass weevil", **Hyperodes spp**. adults under a program similar to that described above. The following experiments were conducted on a field scale in Ohio and New Jersey to test this method of control for **Ataenius**.

MATERIALS AND METHODS

Manasquan, New Jersey -- Sections of 2 fairways on the Manasquan River Golf Club were treated May 4, 1976 with 3 lb. AI/A chlorpyrifos (Dursban 4EC) or 6 lb. AI/A diazinon (AG-500-4EC). A tractor drawn hydraulic sprayer which applied 40 gal. of spray per acre was used to make the application. The test fairways were lightly irrigated after application. An untreated area was left in each of the test fairways.

Field conditions at the time of treatment were as follows: (1) **Adults** - flying actively on warm evenings; population 9 per ft.^{2} on fairways; no other stages evident (2) **Turf** - fairway of mixed **Poa annua** and bentgrass; turf and soil moist; thatch 0.25 to 0.5 inches.

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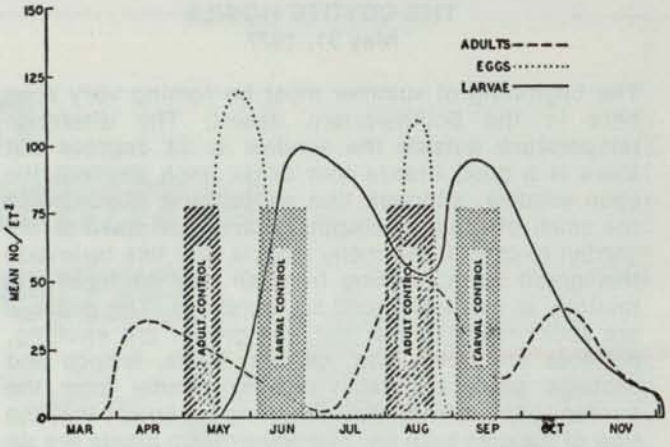

Fig. 1. TENTATIVE development pattern of **Ataenius spretulus** life stages at Cincinnati, Ohio and optimal times for application of adult and larval controls. 1976 - (Niemczyk & Wegner).

Cincinnati, Ohio -- Three complete fairways of the Hyde Park Country Club were treated April 23, 1976 with 2 lb. AI/A chlorpyrifos (Dursban 4EC) and another 3 with 6 lb. AI/A diazinon (AG-500-4EC).

Two complete fairways of the Terrace Park Country Club were treated April 22, 1977 with 4 lb. AI/A chlorpyrifos (Dursban 4EC).

Two complete fairways of the Crest Hills Country Club were treated April 26, 1977 with 8 lb. AI/A carbaryl (Sevin 80S).

In all of the above cases the insecticides were applied with a hydraulic sprayer at 20 gal. of spray per acre. An area ca. 100 ft. x 30 ft. on either the tee or green end of each test fairway was left untreated. Each fairway received ca. 0.1 inch irrigation after being treated.

General field conditions at the times of treatment were as follows: (1) **Adults** - actively flying 4 to 7 PM; common on golf course greens; no evidence of egg laying; populations per square foot of fairway ranged from 4 (Crest Hills) to 11 (Terrace Park) (2) **Turf** - fairways consisting of 80-90% **Poa annua**, the remainder mostly bentgrass; turf and soil moist; thatch depth in inches, 0.5 (Crest Hills); 0.75 (Terrace Park and Hyde Park).

Pre-and post-treatment evaluations included counting the number of live adults in and on a circular area of turf 4.25 x 3 inches. A standard golf course cup cutter was used for this purpose. From 10 to 20 such samples were taken in both the treated and untreated portions of the test fairways. In later samples, only the larvae present were counted.

RESULTS

DIAZINON -- The data from Ohio and New Jersey show that a single application of 6 lb. AI/A diazinon gave good control of adults and prevented the development of a significant larval population (Tables 1 and 2).

CHLORPYRIFOS -- The data from Hyde Park and Terrace Park Country Clubs show that even though 2 and 4 lb. AI/A chlorpyrifos apparently controlled the adults, a significant larval population developed (Tables 2 and 3). Samples taken May 26 and 27 showed larvae were present, therefore we can assume that the eggs from which these larvae developed were laid beginning ca. the 3rd week of May. Even though the data on adult control do not reflect a lack of

control, it is apparent the adults survived the chlorpyrifos residue long enough to lay eggs. The test fairways at both golf courses required treatment with another insecticide to prevent damage by the larvae.

Fairways at Manasquan, New Jersey treated May 4 with 3 lb. AI/A chlorpyrifos showed that while control of adults was variable, no significant larval population developed. We do not know how but the desired effect was achieved.

CARBARYL -- Unfortunately, data obtained on carbaryl 8 lb. AI/A were limited to adults only (Table 4). The only report we can make regarding the subsequent development of a larval population is that the test fairways did not require additional treatment. Other untreated fairways on the course did require treatments.

CONCLUSIONS

The data from these tests indicate that a single application of liquid diazinon at 6 lb. AI/A should give good control. Chlorpyrifos may also be effective, however, in view of the apparently short residual, 2 applications of 2 lb. AI/A at a 10 day interval probably would be necessary to prevent the development of a larval infestation. This approach and the efficacy of diazinon 14% granular will be tested in 1977.

Based on the present level of our knowledge concerning when **Ataenius** adults begin laying eggs (Fig. 1) in Cincinnati, the optimum time to apply treatments for adult control would be the first week of May. Additional studies now underway should reflect the extent to which this event varies from year to year. We hope to key first egg laying to some phenological event, such as the flowering of certain annuals, trees or shrubs. These would be used as indicators of the time treatments should be applied.

Table 1. RESULTS OF Ataenius spretulus ADULT CONTROL EXPERIMENT - Manasquan, New Jersey - 1976

Date and Days After Application		Diazinon® 4 EC 6 lb AI/A		Dursban® 4 EC 3 lb AI/A	
		Live Adults/Square Foot			
		Treat	Check	Treat	Check
(5/3)	0		9.		8.2
(5/10)	6	2.4	6.1	2.0	4.4
(5/17)	13	0	2.4	2.7	1.0
(5/24)	20	0	0	0	0
(6/1)	28	0	0	0	5.8
		Larvae/Square Foot			
(6/21)	48	3.3	85.5	2.0	74.1

Section of 2 fairways treated May 4, with each insecticide.

Table 2. RESULTS OF Ataenius spretulus ADULT CONTROL EXPERIMENT - Hyde Park C.C., Cincinnati, Ohio - 1976

Date and Days After Application		DIAZINON® 4 EC 6 lb AI/A		DURSBAN® 4 EC 2 lb AI/A	
		Live Adults/Square Foot			
		Treat	Check	Treat	Check
(4/21)	0		9.1		6.3
(5/5)	12	0	5.4	0	3.0
(5/17)	24	0	5.0	0	3.3
(5/27)	34	0	1.0	0	0.4
		Larvae/Square Foot			
(5/27)	34	2.0	21	7.4	18
(6/11)	46	8.9	88	42.1	94

3 complete fairways treated April 23 with each insecticide.

The best way to meet people when you move into a new neighborhood is to let the word get around that you have a cable for jump-starting stalled cars.

Table 3. RESULTS OF Ataenius spretulus ADULT CONTROL EXPERIMENT - Terrace Park C.C., Cincinnati, Ohio - 1976.

Date and Days After Application		DURSBAN® 4 EC 4 lb AI/A	
		Live Adults/square foot	
		Treat	Check
(4/21)	0		11.7
(5/6)	14	0	3.0
(5/18)	26	0	3.5
(5/26)	34	0	1.5
		Larvae/ft^2	
(5/26)	34	12.9	35.5

2 complete fairways treated April 22.

Table 4. RESULTS OF Ataenius spretulus ADULT CONTROL EXPERIMENT - Crest Hills C.C., Cincinnati, Ohio - 1976.

Date and Days After Application		SEVIN® 80S 8 lb AI/A	
		Live Adults/ft^2	
		Treat	Check
4/26	0		4.0
5/6	10	0	2.5
5/19	23	0	1.5
5/27	31	0	3.0

2 complete fairways treated April 26, 1976.