



Better Turf for Better Golf

TURF MANAGEMENT

from the USGA Green Section

Fungus Gnat Found To Inhibit Development Of Turfgrass

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Greenhouse experiments conducted at the University of Massachusetts from 1956 through 1958 have revealed an injurious effect of Fungus Gnat *Bradysia impatiens* (Joh.) larvae on the growth of Kentucky bluegrass *Poa pratensis* (Linn.) and Creeping red fescue *Festuca rubra* (Linn.) sod. Growth of both foliage and roots became reduced as the infestation of larvae increased. At no time was an entire culture completely destroyed; however, such thin and weak turf resulted that normal characteristics of quality turfgrass were eliminated. Larvae of the fungus gnat were observed to feed on the fine roots of these turfgrass species.

Turfgrass grown in nutrient solution cultures was found susceptible to a mildly pathogenic fungus of the genus *Cephalosporium**. This organism developed during early sod formation and has been found in the upper root zone and throughout the crowns of the plants. Coincident with the period of fungal development all stages of the fungus gnat *Bradysia impatiens* (Joh.)** were observed. Sufficient gnats were present in the greenhouse during fall, winter and spring to provide an infestation whenever conditions within the cultures were favorable. At such times adult flies gradually increased in numbers over a period of a

week or two accompanied by corresponding increases in numbers of larvae and pupae. These (larvae and pupae) were observed in the culture seedbed and on the upper roots and within the crowns.

Bradysia impatiens (Joh.) is widely distributed throughout the eastern United States. The species breeds abundantly in soil and compost mixtures used for growing greenhouse plants. It has rarely been reported from any other type of habitat. There have been no known previous reports of fungus gnat injury to grasses. Parr et al⁽³⁾ report that larvae have been found feeding on root hairs of greenhouse tomato plants causing growth retardation and collapse of the plant by further tunneling into the stem. Injury to potato tubers has also been reported⁽²⁾. A few species have been known to cause damage to mushrooms in cultivation⁽¹⁾.

Complete control of larvae was obtained by dipping roots in a suspension of chlordane (50% wettable powder mixed at a rate of 0.6 oz. per gallon of water). One treatment provided sufficient residual effect to kill larvae as they hatched during succeeding weeks. It was noted that immediately following treatment, new roots developed and turf resumed normal growth. The standard rate of chlordane for application to turfgrass grown in soil (8 oz. 50% wettable powder

in 25 gallons of water for 1,000 sq. ft.) would be equivalent to that used in these experiments.

Conclusions

Larvae of the fungus gnat *Bradysia impatiens* (Joh.) were found to feed on the fine roots of Kentucky bluegrass *Poa pratensis* (Linn.) and Creeping red fescue (*Festuca rubra* (Linn.)). It was noted that a moist seedbed and the presence of fungus mycelium were necessary for a fungus gnat infestation. Satisfactory control was obtained by use of chlordane in amounts equivalent to recommended rates. Conditions favorable for fungus gnat injury to turfgrass grown out-of-doors are believed to occur less frequently than in the greenhouse; however, chlor-

dane applied at standard rates should provide good control.

References

1. Curran, C. H. 1934. The families and genera of North American flies. The Ballou Press, New York, N. Y.: 118-119.
2. Gui, H. L. 1933 The potato scab gnat *Pnyxia scabiei* (Hopkins) Ohio Agriculture Experiment Station Bulletin 525: 9-11.
3. Parr, W. J., Crocker, C. and Speyer, E. R. 1954 A Sciarid Fly Injurious to Seedlings. Thirty-ninth Rep. Exp. Res. Sta. Cheshnut, England: 36-39.

* As determined by Joseph Troll, Department of Agronomy, University of Massachusetts.

** As determined by R. R. Shaw, Department of Entomology, University of Massachusetts.

Golf Course Ponds and Lakes

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Small bodies of water on a golf course contribute to the beauty of the course and in some cases may be involved in the strategy of play. A good "water" hole adds to the interest of a golf course.

Some ponds are completely man made, having been created by the golf course builder who needed a source of soil for construction purposes. Others, of course, may occur naturally or may have been formed by the damming of a water course through the club property.

The building of a lake must be based upon some of the conditions of the surrounding area. Usually, about 25 acres of watershed will provide enough runoff for a one-acre pond. However, this figure will vary with amount and distribution of rainfall, degree of slope, kind and amount of vegetation and other factors which influence the runoff characteristics of an area. Runoff water from an area covered by close growing vegetation is to be preferred over that from areas which may be cultivated. Turfed areas allow relatively little silt to be moved by runoff water.

If ponds are large enough to permit effective management they may be stocked with fish. At country clubs, a stocked lake provides an added form of recreation for members. About 1/2 acre is the minimum size lake suitable for stocking with fish. On the other hand the management of

lakes larger than 3 acres in size becomes a rather large job.

Fertilization of ponds has come to be an accepted practice. It has been demon-

Table 1

CHEMICAL CONTROL OF THE COMMON EMERGENT AND FLOATING PLANTS

| Plant | Control Mixture |
|--|---|
| Water hyacinth (Eichhornia) Lotus (Nelumbo) | 40 percent amine salt of 2,4-D at rate of 1 1/2 gallons of 2,4-D amine salt solution plus 1/2 gallon of emulsifiable oil to 100 gallons of water per surface acre to be sprayed. Use pressure sprayer. |
| *Cattails (Typha) Bulrush (Scirpus) Water lilies (Nuphar, etc.) except spatterdock or yellow water lily. Other broad-leaved emergent plants | 40 percent amine salt of 2,4-D at the rate of 2 1/2 gallons of 2,4-D amine salt solution plus 2 gallons of emulsifiable oil to 100 gallons of water per surface acre to be sprayed. Use pressure sprayer. |
| Spatterdock or yellow water lily. | 2,4,5-T (4 pounds acid equivalent) at the rate of 2 gallons 2,4,5-T plus 1 gallon emulsifiable oil plus 100 gallons of water per surface acre to be sprayed. Use pressure sprayer. |

*Cattails also can be controlled by using 25 pounds of Dalapon (sodium salt 85%) mixed with 100 gallons of water. This mixture is sufficient for spraying 1 acre of cattails.