

KENTUCKY BLUEGRASS THATCH RESPONSE TO BIO-ORGANICS, NITROGEN  
CARRIERS AND INSECTICIDES

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The dynamics of turfgrass thatch are poorly understood. Ledebauer and Skogley (1) state that thatch accumulation results from turf management procedures which favor vegetative growth. Shearman *et al.* (2) alternatively state that increasing N rate does not increase a turfs thatching tendency. The purpose of the present research was to evaluate whether turfgrass thatch decomposition was influenced by nitrogen or insecticide application. A secondary objective was to determine whether nitrogen or insecticide influenced Necrotic Ring Spot (NRS) activity.

The study was conducted during 1987 and 1988 on a seeded block of "Touchdown" Kentucky bluegrass (*Poa pratensis* L.) located at the Robert Hancock Turfgrass Research Center in East Lansing, MI. Treatments consisted of Ringers Lawn Restore, urea, IBDU, A-199, and PDC applied at rates of 1 pound of N per 1000 square feet. Treatments were applied monthly with and without label rate applications of chlordane (insecticide). Bio-Control was also applied monthly at the label rate with and without chlordane. Check plots were also established. In addition, each plot was inoculated with *Leptosphaeria korrae*, the causal agent of NRS, which was previously reared on sterile wheat seeds.

During May 1988, 4 thatch sub-samples per plot were taken with a core sampler to a depth of 2 inches. Samples were washed to remove soil, dried at 60 C and stored in the dark until analysis. Dry sub-samples were weighed and the values averaged to obtain plot means. The plot means were subjected to analysis of variance and treatment means were finally obtained. The treatment means are presented in Table 3. Analysis of variance indicated that highly significant differences in thatch weight were detected. Differences were attributable to N carrier and insecticide. When treatment means were separated with LSD at  $P = 0.05$ , only thatch treated with urea and IBDU showed a significant decline in thatch weight compared to the untreated check. Thatch treated with urea averaged 4.16 pounds per square meter and thatch treated with IBDU averaged 3.96 pounds per square meter while untreated thatch averaged 6.47 pounds per square meter. It was also determined that the application of Chlordane significantly negated decomposition potential. In fact, Chlordane (or reduced insect activity) stimulated thatch accumulation in the check plots to an average value of 9.75 pounds per square meter. Data on NRS is not yet available as ring spot activity is just now beginning.

Application of nitrogen to thatch appears to enhance thatch reduction while reducing insect activity negates this effect. Thus, the turf manager should be aware that cultural practices do affect thatch equilibrium. Decreasing a wide C:N ratio by adding N will generally increase thatch decomposition while eradication of macro-decomposers such as mites and earthworms will decrease thatch decomposition. Addition of exogenous micro-organisms (i.e., addition of bio-organics) probably has a small overall effect since considerable organic matter is also added.

REFERENCES:

- 1) Ledebor, F.B., and C.R. Skogley. 1967. Investigations into the Nature of Thatch and Methods for its Decomposition. Agronomy Journal 59:320-323.
- 2) Shearman, R.C. et al. 1980. Thatch accumulation in Kentucky Bluegrass as influenced by Cultivar, Mowing and Nitrogen. HortScience 15(3): 312-313.

TABLE 3. Mean thatch weight to a depth of 2 inches below verdure. Values are reported in pounds of thatch per square meter.

| <u>TREATMENT</u>         | <u>THATCH WEIGHT</u> |
|--------------------------|----------------------|
| Lawn Restore             | 4.97                 |
| Lawn Restore + Chlordane | 5.57                 |
| Urea                     | 4.16*                |
| Urea + Chlordane         | 4.53*                |
| IBDU                     | 3.96**               |
| IBDU + Chlordane         | 6.37                 |
| Bio Control              | 5.41                 |
| Bio Control + Chlordane  | 6.87                 |
| A-199                    | 5.69                 |
| A-199 + Chlordane        | 7.21                 |
| P.D.C.                   | 5.51                 |
| PDC + Chlordane          | 8.33±                |
| CHECK                    | 6.47                 |
| CHECK + Chlordane        | 9.75±                |
| LSD <sub>0.05</sub>      | 0.93                 |
| LSD <sub>0.01</sub>      | 1.25                 |

\* Denotes significance @ P = 0.05

\*\* Denotes significance @ P = 0.01

± Denotes significant thatch accumulation above CHECK