ANNUAL REPORT

COMPOSTED AND ORGANIC FERTILIZERS ON TURF AND THEIR VALUE IN REDUCING THE INCIDENCE OF TURF DISEASES AND INSECT PESTS

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Summary of field trials

A. Six composts derived from different organic sources, a dried sewage sludge (Milorganite), a commercially available organic amendment derived from sewage sludge for turf use (Lawn Restore) and the fertilizer urea, were included in an expanded version of the 1988 trial at the URI Experiment Station Turfgrass Research Farm.

Replicated (4) plots of Kentucky bluegrass (6' x 14'7" = 1/500 acre) were topdressed with the materials at rates equivalent to 2 lbs. Of actual nitrogen (N) per thousand square feed on 6.14, 7/19 and 11/7/89 (see Table 1).

Prior to the initial application lysimeters were installed in three of the four replicate plots per treatment to enable monitoring of the nitrogen leached through the top sixty centimeters of soil after each substantial rain event (see Fig. I).

B. Replicated (4) plots of perennial ryegrass (2M x 1M = 1/2000 acre) were top dressed with the above materials at rates equivalent to 1 lb. (Trial B I) and 2lbs. (Trail B II) of N per thousand square feet on 6.5 and 7/25 (Trial B 1) and 6/28 and 7/25/89 (Trial B II) The chitin-based, commercially available, organic amendment Clandosan was also included in Trial II at the 2 lbs. N rate (see Table II.)

Each plot was inoculated with four 2" plugs taken from active patches of necrotic ring spot. Four 2" pugs of healthy turf from the quarter centers of each plot were replaced with the diseased turf plugs on 10/18/88.

C. A Kentucky bluegrass lawn in North Kingstown, RI naturally infected with necrotic ring spot (a patch disease caused by the fungus Leptosphaeria korrae) was selected as a trial site in the spring of 1989. Treatments included organic fertilizers: Sustane, Milorganite, Lawn Restore, Clandosan and a general turf fertilizer, (Mn 5/10/5). Applications aquivalent to 1-1/2 lbs. Of N per 1000 sq. ft. for each material were made on 6/12, 7/28 and 11/11/89 to replicated (4) plots 5' x 15' = 75 sq. ft. in area (see Table III).

Plots were rated periodically for turf quality (color and density), disease incidence, and insect grub activity (A. only). Data are presented in tables I, II, III and Fig. I.

Observations and Results

1) Objectionable residues (wood chips, fish bones, stones) were present in some of the composts (eg. West Warwick, Merner). Particle size and/or consistency for easy spreading varied from very good (**Sustane**, Milorganite) to poor (Lawn Restore, Allgro composts – when too wet).

2) Allgro CMC (chicken manure compost) and occasionally Allgro BWC (brewery waste compost) continued to generate ammonia. Use of these materials straight from the bag can cause phytotoxicity. A longer curing period should be adopted prior to bagging.

3) Turf quality ratings (A, Table I) indicate the benefit of these materials in promoting growth of turfgrasses and this effect is related directly to the available nitrogen content. Comparison with quality values for 1988 (not included) showed the 1989 season responses to be lower on Kentucky bluegrass. This is probably a reflection of the well-above-average rainfall experienced over the 1989 season, and the concommittant increase of leaching of nitrogen.

4) A record of nitrate leaching to 60 cms (A, Fig. I) shows differences between the materials applied. Urea had the highest values. Nitrate leaching under the control (non-treated) plots, surprisingly was higher than all other treatments except urea. The reason for this is unclear, but it may relate to N retention by higher microbial populations generated in turf by the other treatments.

5) The Kentucky bluegrass turf remained free of all disease with the exception of trace amounts of dollar spot. Turf plugs infected with necrotic ring spot that were introduced into the trial plots apparently failed to spread the disease (A, Table I).

Turf insect populations were low overall and no treatment differences were apparent (A, Table I).

6) When applied to Kentucky bluegrass turf infected with necrotic ring spot, organic amendments may influence build up of the disease over the season. Plots receiving **Sustane,** Miorganite, Lawn Restore and Clandosan had the least necrotic ring spot by November. However, summer incidence of brown patch (caused by Rhizoctonia solani) was increased by most of the treatments (C, Table 3).

Turf quality ratings for C indicate that on this site more frequent applications should have been made to maintain turf of acceptable quality. Additional applications could well reduce further the incidence of necrotic ringspot, but at the expense of more brown patch. This apparent paradox will be addressed next season.

7) Red thread disease developed extensively on perennial ryegrass turf during June and July 1989. All of the applied materials reduced red thread symptoms, but to varying degree. The benfit of nitrogen in aiding the infected plant to repair or replace tissues damaged by Laetisaria fuciformis (the red thread causal organism) is well documented. Thus the effectiveness of the

materials in suppressing the disease is directly related to their available nitrogen content. This is also reflected in the turf quality data. With the regimen employed, Perrenial ryegrass turf was better than that of bluegrass. Either it is less demanding of nitrogen, more efficient in uptake or both (B, Table 2).

8) Green house trials are still underway to demonstrate the effects of the various compounds on soil-borne fungal pathogens of Kentucky bluegrass. Difficulties have been experience in reproducing the environmental parameters conductive to normal turf growth and fungal infection. Experiments conducted in 1989 yielded no worthwhile results and were terminated. A new series is underway and, hopefully, results will be available in a few months.