

PHYSIOLOGY RESEARCH: CHEMICAL GROWTH REGULATORS,
WATER USE RATES, THATCH CAUSES, AND LOW TEMPERATURE KILL

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This paper reviews the results of selected turfgrass physiology and ecology research projects conducted at Michigan State University during the past year. The investigations were partially supported by donations of maintenance equipment, chemicals, fertilizers, and irrigation equipment from numerous turfgrass equipment and chemical companies throughout the state. Their continuing cooperation in furthering these research projects has been very valuable. Funds for the operational expenses have been provided in part through grants from the Michigan Turfgrass Foundation. Finally, the thatch research has been supported by a grant from the O. J. Noer Research Foundation.

CHEMICAL GROWTH REGULATOR EVALUATIONS

Four of the newer chemical growth regulator treatments plus an untreated check were utilized in this study conducted at Traverse City, Michigan, on a loamy sand site. A mature, infrequently mowed stand of Kentucky bluegrass, red fescue, and annual bluegrass with a scattering of quackgrass was used. The plot area was irrigated as needed to prevent wilt.

The growth inhibitor treatments were applied in three different combinations across three replications. The individual plot size was 6 x 10 feet. One-third of the experimental area received a single application on May 18th. This was just after the first mowing of the turf in the spring. The remainder of the plot area also received the same May 18th application. A second application was applied six weeks later on June 28th. The treatments were also applied over the remaining one-third. Finally, a third application was applied to the last one-third of the plot area on August 9th. Thus, the plot area was split into three sections, one receiving a single spring application, one receiving a spring and early summer application, and a third receiving three applications over the spring and summer period. The experimental plot area was not mowed at any time during the growing season.

Table 1. Comparative shoot growth inhibition achieved from four chemical growth regulator treatments on a Kentucky bluegrass-red fescue-annual bluegrass turf.

| Treatment | Application Rate (lb. /A) | Degree of shoot growth inhibition* | |
|--|------------------------------|------------------------------------|---------|
| | | (1-best; 9-least) June 15 | June 29 |
| Maintain CF-125 + Maleic hydrazide (MH-30) | 1 + 3 | 1.8 | 1.3 |
| Sustar (3M) | 4 | 3.0 | 1.7** |
| C-19490 (Geigy) | 7.5 | 5.2 | 3.8 |
| Maintain CF-125 | 2 | 6.7 | 6.3 |
| Untreated | - | 9.0 | 9.0 |

*Average of 3 reps.

**Chlorosis and some thinning of stand evident

The growth inhibition results are summarized in Table 1. Maintain CF-125 at 2 pounds per acre has been the best performing growth regulator in earlier experiments. In this particular series with newer materials it was the poorest of the four treatments. The best treatment in terms of overall performance was a combination of Maintain CF-125 at one pound plus maleic hydrazide at 3 lbs/acre, Sustar also gave good growth inhibition although not ranking quite as high as the Maintain CF-125 + maleic hydrazide combination. The Sustar treated plots did show some chlorosis and thinning of stand following the second and third repeat applications on the plot area. Finally, the Geigy C-19490 experimental material proved highly phytotoxic resulting in extensive thinning of the turfgrass stand and at the same time failing to provide adequate shoot growth inhibition of the surviving plants. A certain degree of leaf injury or foliar burn was evident from all four chemical growth regulators following the third application made on August 9.

This chemical growth inhibitor study has been the most effective and successful of the long series that has been conducted by Michigan State University at various locations throughout the state. The key in this case was that the initial application was made at just the right time in the spring. This timing is the most critical and difficult aspect to execute in the use of chemical growth regulators. A similar series of experiments will be repeated during the 1973 growing season at both Traverse City and East Lansing to ascertain if comparable results can be obtained for a second year.