STOP: 5

Chemical Growth Retardants

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The idea of chemical mowing has been around for a long time. Researchers at MSU have conducted investigations as early as 1968. Many difficulties were encountered in obtaining consistant results with these chemicals:

1. Age and length of leaf tissue
2. Time of the year to apply
3. Adequate and uniform coverage
4. Adequate rapid absorption
5. Restriction of root and rhizome growth
6. Retardation of one species and not another
7. Increased susceptibility to pest invasion

In 1968, David Martin reported on six chemical growth retardants at the Traverse City Field Day. He concluded the MH-30 (Maleic Hydrazide) and Maintain CF-125 were the two most promising. However, nearly all of the above listed problems remained a concern.

In 1972, James Beard reported at field day that a mixture of Maleic Hydrazide and Maintain was the most promising retardant. Sustan was also included in this study and showed good promise. However, control with both of these materials was somewhat erratic.

In 1974, Dave Duncan concluded that Sustan and the mixture of Maleic Hydrazide and Maintain were superior to a new experimental chemical MBR-12325. This new chemical (now known as Embark) gave the best growth inhibition but caused serious foliar burn following application.

In 1977, Steve Jackson reported on the use of CME10951, Maintain, Ethrel, and Embark. Embark was found to be the best growth retardant in all areas except weed control. Simultaneous applications of broadleaf weed control are important.

On May 9, 1979, MBR18337, Embark, Ethrel and an Embark-Endothol combination were sprayed on mature Kentucky bluegrass. The area had been mowed several times and was mowed four days prior to spraying. The area was again mowed 48 hours after spraying. A significant rain did not occur during those two days.

The results show that Embark caused greater early foliar burn symptoms. The new MBR material was much less toxic than Embark. Under the conditions of the study, Ethrel was not effective in controlling seed heads or vegetative growth. Part of this problem may have been due to the mowing after treatment.

When Embark and Ethrel were mixed, chemical incompatability occurred, so the treatment could not be applied. Thus Endothol was chosen to provide some associated weed control. As indicated in the data, the addition of

Endothol reduced the effectiveness of Embark.

In summary, both MBR-18337 and Embark were effective in retarding shoot growth of Kentucky bluegrass. However, MBR-18337 exhibited less early foliar toxicity than Embark.

Table A. The Effect of Chemical Growth Retardants On Shoot Growth On Kentucky Bluegrass

Relative Rank	Treatment	AI/4	Growth Retardation (1-9; 1-Best)
1	MBR(18337)	1/8	3.0a
2	MBR	1/4	3.0a
3	Embark & MBR	1/4 + 1/4	3.0a
4	MBR	1/2	3.0a
5	Embark	1/2	3.0a
6	MBR	1	3.0a
7	Embark	1	3.0a
8	Embark	1/4	3.7 b
9	Embark	1/8	4.3 b
10	Embark & Endothol	1/4 + 1	5.0 c
11	Ethrel	4	7.3 d
12	Ethrel	8	7.3 d
13	Ethrel	2	8.0 e
14	Check	-	9.0 f

$S_{\bar{x}} = 0.2195$

Table B. The Effect Of Chemical Growth Retardants On Discoloration Of Kentucky Bluegrass

Relative Rank	Treatment	AI/A	Color (1-9; 1-Best)
1	Check	-	2.0a
2	Ethrel	2	2.0a
3	Ethrel	4	2.0a
4	Ethrel	8	2.3ab
5	Embark & Endothol	1/4 + 1	2.3ab
6	MBR(18337)	1/8	2.7ab
7	Embark	1/8	3.3 bc
8	MBR	1/4	3.3 bc
9	Embark & MBR	1/4 + 1/4	4.0 c
10	Embark	1/4	4.0 c
11	MBR	1/2	4.3 c
12	Embark	1/2	5.7 d
13	MBR	1	6.3 d
14	Embark	1	6.7 d

$S_{\bar{x}} = 0.3272$