

1984 HERBICIDE EVALUATIONS

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1984 was a very interesting year for evaluating new agricultural chemicals for use on turf. Several new products will be marketed in 1985 including Turflon D from Dow Chemical, which is a 2:1 mixture of the butoxyethyl esters of 2,4-D and triclopyr; Acclaim, which is a postemergent crabgrass herbicide from American Hoescht; and Limit, a plant growth regulator from Monsanto. These products as well as several other new herbicides and plant growth regulators were tested in 1984.

The first area of research to report on does not concern new herbicides, but relatively old ones. This study was designed to examine the interaction between preemergent herbicides and different cultivation operations. Four herbicide treatments (bensulide, DCPA, benefin, and a check), four cultivation treatments (coring 1X, coring 3X, vertical mowing, and a check), and two timing treatments (cultivation immediately after herbicide application or three weeks after herbicide application) were combined in all combinations to yield 32 herbicide-timing-cultivation treatments.

The results of this study are seen in Table 1. The only factor which had a significant effect on crabgrass populations was herbicide treatment. The cultivation treatments or timing of cultivations had no significant effect on percentage of crabgrass in the plots. It has always been assumed that coring or cultivation treatments would disrupt the preemergent barrier, however, this does not seem to be the case. This study will be repeated next year to confirm these results.

Two new herbicides for postemergence crabgrass control were studied this year. Acclaim which was previously mentioned and Curfew which is being developed by Dow Chemical. These two herbicides show promise for effective, single application control of crabgrass. Use rates for the two herbicides are between 0.5 and 1.5 lbs AI/A for Curfew and 0.08-0.35 lbs AI/A for Acclaim. Higher rates are needed as the crabgrass matures during the season. A study was put out with applications on July 26 and August 8 at the Hancock Turfgrass Research Center. Results (Table 2) of this study show that Acclaim was effective at all ranges tested whereas Curfew was only effective at the 1.0 and 1.5 lb AI/A rates. Acclaim has an advantage in that it seems to kill the crabgrass plants much faster than does Curfew. Curfew has both pre and postemergent activity whereas Acclaim is strictly postemergent. Both products look promising and will fill a void that has long existed in turf weed control.

A second set of studies tested several broadleaf herbicides including Turflon D, Weedone DPC, triclopyr, and fluroxypyr. The results of these studies are shown in Tables 3 to 5. Fluroxypyr, from Dow Chemical, is a very promising broadleaf herbicide as shown by its control of oxalis and clover.

Fluroxypyr is sold in Europe under the trade name Starane which is the name used in Tables 3 to 5. Turflon D is an ester formulation which is currently available from Dow; the amine formulation is not yet commercially available.

PLANT GROWTH REGULATORS

Several studies were put out with the plant growth regulators Limit, (amidochlor), Embark (mefluidide) and EL-500 (flurprimidol). Each of these materials has its own niche in cool season turfgrass species. Embark is a good PGR that gives both vegetative and seedhead suppression. It has good potential in both the roadside and commercial applications. Data in Table 6 shows specialized use of Embark for controlling annual bluegrass seedhead production. For the second year in a row, applications of Embark after the accumulation of 50 growing degree days provided the best control of annual bluegrass seedheads. Table 6 shows the calendar days that the various degree day treatments were applied. The top three treatments all had a surfactant applied with the treatments. The surfactant aids in getting more of the Embark into the plant and while the seedhead control was good, the injury from the Embark was severe. At the present time we don't recommend adding a surfactant to Embark applications.

Limit has qualities which make it best suited for commercial applications such as parks, cemeteries, and other medium to low maintenance turfed areas. Limit provides excellent seedhead control and very good vegetative control. One problem encountered this past summer was the occurrence of Septoria leaf blight in plots of "Baron" Kentucky bluegrass treated with Limit. However, a companion study on Kenblue common Kentucky bluegrass failed to show significant levels of the Septoria infection.

EL-500 is a growth regulator which is aimed at the golf course market. EL-500 seems to be able to retard annual bluegrass more severely than creeping bentgrass, and may be used as a tool to convert fairways to predominately creeping bentgrass. We have examined EL-500 for the past two summers but have not been able to quantify its effect on the competition between annual bluegrass and creeping bentgrass. We will continue to experiment with this material and will have some concrete data on its effect to a mixed annual bluegrass creeping bentgrass stand after the summer of 1985.

TABLE 1. Analysis of Variance for Preemergent
Herbicide - Cultivation Interaction Study

<u>Factor</u>	<u>df</u>	<u>MS</u>	<u>F</u>	<u>P%</u>
Reps	2	0.41	2.12	12.61
Herbicide	3	1.19	6.25	0.12*
Cultivation	3	0.25	1.31	27.92
Herb x cult	9	0.24	1.26	27.66
Timing	1	0.17	0.87	-
Herb x timing	3	0.08	0.44	-
Cult x timing	3	0.03	0.15	-
Herb x cult x timing	9	0.09	0.48	-
Error	62	0.19	-	-

* Values less than 5 are significant at the 5% level; values less than 1 are significant at the 1% level.

Table 2. Postemergent Control of Crabgrass in Annual Bluegrass

<u>Treatment</u>	<u>Application Date</u>	<u>Injury</u> <u>8-16</u>	<u>Percent</u> <u>Crabgrass</u> <u>8-16</u>	<u>Percent</u> <u>of Control</u> <u>8-16</u>	<u>Percent</u> <u>Crabgrass</u> <u>9-12</u>	<u>Percent</u> <u>of Control</u> <u>9-12</u>
XRM 4763 1.5 lb/A	8/8	8.0 A	33.3 DE	0 B	0 A	99 A
Acclaim 0.35 lb/A	8/8	9.0 A	13.3 ABCD	3 B	0 A	99 A
Acclaim 0.25 lb/A	8/8	9.0 A	16.7 ABCD	28 B	0.7 A	97 A
XRM 4763 1.5 lb/A	7/26	3.3 D	3.4 A	89 A	1.4 AB	95 A
Acclaim 0.25 lb/A	7/26	8.7 A	0 A	99 A	1.4 AB	96 A
Acclaim 0.18 lb/A	8/8	9.0 A	26.7 CDE	23 B	1.4 AB	97 A
Acclaim 0.18 lb/A	7/26	9.0 A	0 A	99 A	2.0 AB	88 AB
Acclaim 0.12 lb/A	7/26	9.0 A	2.7 A	94 A	5.0 A	87 AB
XRM 4763 1.0 lb/A	8/8	8.7 A	20 ABCDE	0 B	5.0 AB	68 BC
EH 795 1.0 gal/A	7/26, 8/8	8.3 A	16.7 ABCD	17 B	9.3 ABC	52 CD
XRM 4763 1.0 lb/A	7/26	4.7 C	10 ABC	73 A	10 ABC	68 BC
EH 795 0.8 gal/A	7/26, 8/8	9.0 A	26.7 CDE	8 B	11.7 ABC	57 CD
XRM 4763 0.75 lb/A	8/8	9.0 A	31.7 CDE	5 B	13.3 BC	58 CD
XRM 4763 0.5 lb/A	7/26	6.2 B	25 BCDE	17 B	18.3 CD	61 CD
XRM 4763 0.75 lb/A	7/26	5.7 BC	31.7 CDE	13 B	18.3 CD	48 CD
XRM 4763 0.5 lb/A	8/8	9.0 A	40 E	0 B	18.3 CD	44 D
Check		9.0 A	35 DE	0 B	25.0 DE	0 E
EH 195 1.6 gal/A	7/26	9.0 A	35 DE	0 B	30.0 E	0 E

Table 3. Herbicide Efficacy on Dandelion
Treatments Applied 7-12-84

<u>Treatment</u>	<u>Rate</u>	8-6 <u>% Dandelions/Plot</u>	9-2 <u>% Dandelions/Plot</u>
2,4-D + MCPP	3/4 + 3/4 lb/A	3.4 A	11.7 A
Trimec	4 pts/A	5.0 A	20 AB
2,4-D amine	1.3 lb/A	6.7 AB	26.7 AB
Turflon Amine	0.5 + 1.3 lb/A	8.3 ABC	23.3 AB
Starane + 2,4-D	1/4 + 3/4 lb/A	8.4 ABC	21.7 AB
Turflon Amine + MCPP	3/8 + 1 + 1/2 lb/A	10.0 ABC	20 AB
Weedone DPC	4 pts/A	10.0 ABC	13.3 A
Starane	1/2 lb/A	10.0 ABC	20 AB
Turflon D	3/8 + 3/4 lb/A	13.3 ABC	25.0 AB
Turflon Amine	3/8 + 1 lb/A	15.0 ABCD	26.7 AB
2,4-D amine	1.0 lb/A	15.0 ABCD	50 BCD
Turflon D	1/2 + 1 lb/A	18.3 ABCDE	38.3 ABC
Turflon Amine + MCPP	1/4 + 5/8 + 1/2 lb/A	21.7 ABCDEF	46.7 BCD
Starane	1/4 lb/A	21.7 ABCDEF	41.7 ABC
Turflon D	1/4 + 1/2 lb/A	23.3 ABCDEF	41.7 ABC
Weedone DPC	3 pts/A	30.0 ABCDEFG	21.7 AB
Garlon 4	1/2 lb/A	33.3 BCDEFG	65.0 CDE
Turflon Amine	1/4 + 5/8 lb/A	35.0 CDEFGH	61.7 CDE
2,4-D amine	1/2 lb/A	35.0 CDEFGH	61.7 CDE
Garlon 4	3/8 lb/A	40.0 DEFGHI	61.7 CDE
2,4-D amine	3/4 lb/A	41.7 EFGHI	63.3 CDE
Starane	1/8 lb/A	46.7 FGHIJ	66.7 CDE
Garlon 4	1/4 lb/A	53.3 GHIJ	63.3 CDE
MCPP	1 lb/A	55.0 GHIJ	63.3 CDE
Buctril	1 lb/A	60.0 HIJK	60 CDE
Buctril	2 lb/A	65.0 IJK	66.7 CDE
MCPP	1/2 lb/A	70.0 JK	78.3 DE
Check		81.7 K	85.0 E

TABLE 4.

CONTROL OF WHITE
CLOVER (TRIFOLIUM REPENS)
TREATED 7-11-84

<u>TREATMENT</u>	<u>% CONTROL (8-6)</u>
STARANE 0.5 LB/A	98 A
WEEDONE DPC 4 PTS/A	75 AB
TURFLON AMINE 0.38+1.0 LB/A	72 B
WEEDONE DPC + BUCTRIL 3 PTS/A+0.5 LB/A	72 B
TURFLON AMINE 0.5+1.3 LB/A	68 B
STARANE 0.25 LB/A	64 B
GARLON 4 0.5 LB/A	63 B
TRIMEC 4 PTS/A	54 BC
BUCTRIL 2.0 LBS/A	32 CD
2,4-D AMINE 1.0 LB/A	19 D
CHECK	12 D

Table 5.

CONTROL OF YELLOW
WOODSORREL (OXALIS STRICTA)
TREATED 7-18-84

<u>TREATMENT</u>	<u>% CONTROL (8-14)</u>
STARANE 0.5 LB/A	100 A
STARANE 0.25 LB/A	98 A
WEEDONE DPC+BUCTRIL 3 PTS+0.5 LB/A	94 A
WEEDONE DPC 4 PTS/A	91 A
GARLON 4 0.5 LB/A	74 AB
BUCTRIL 2.0 LB/A	59 BC
TURFLON AMINE 0.5+1.3 LB/A	41 CD
TURFLON AMINE 0.38+1.0/A	19 DE
2,4-D AMINE	1 E
TRIMEC 4 PTS.	1 E
CHECK	1 E