

1988-89 Crabgrass Update  
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Although summer of 1988 was a banner year for crabgrass, it was also an unusual year. Because of the drought, which started in mid-April and lasted until late July, there was no moisture available for crabgrass germination. The turf was generally thin and weakened and when the rains came in late July and early August the crabgrass literally jumped out of the ground. Lawns that were not on fertility, weed control, and irrigation programs often had more crabgrass than bluegrass. Thus, the year was unusual in that the crabgrass germinated very late but because the weakened turf provided little competition, the crabgrass plants grew and spread very rapidly.

The past year gives turf managers reason to reconsider their preemergence strategy especially when considering some of the new herbicide products which are or will shortly be available. There are three approaches to controlling crabgrass. First and most common, is to use preemergence herbicides only; the second approach would be to use a preemergence in combination with a postemergence herbicide; and the third approach is to only use a postemergence herbicide. The most common approach to crabgrass control is to apply a preemergence herbicide in late March, April or early May to provide a chemical barrier which kills germinating grass seedlings. This approach failed miserably in 1988. A variant to the pre only application is split the applications. This approach calls the first application in early spring at the label rate followed by a second application 45-60 days later at 1/2 of the label rate. This approach will boost the length of effective preemergence control and would have resulted in good crabgrass control in 1988.

A second strategy is to use a combination of pre and postemergence grass herbicides. This option has really just been available since the introduction in 1987 of fenoxaprop (Acclaim®) herbicide, the first selective, one application herbicide for postemergence crabgrass control. This approach calls for delaying the initial preemergence herbicide application until sometime in late May or early June when the first flush of crabgrass has germinated and then applying both a preemergence and a postemergence herbicide. The post herbicide controls the crabgrass that has germinated while the preemergence provides control for the rest of the season. In theory, a lesser rate of the preemergence can be applied, however, no research has yet been conducted to demonstrate this. Data in table 1 shows the control achieved in 1987 from May and June applications of fenoxaprop (Acclaim) alone and in combination with a preemergence herbicide. Notice that the fenoxaprop rate must increase as the crabgrass gets larger to provide effective control. The single applications of fenoxaprop do not provide season long control because it does not control the later germinating crabgrass. This method shows some real promise since it does provide the opportunity for decision making by the turf manager. Using this approach would have saved the cost of a preemergence application in 1988, since no application would have been made until early August at which point a preemergence herbicide would not have been necessary.

A third option is to use postemergence herbicides only. This approach may not make sense economically because on sites with heavy crabgrass infestations it will take two well-timed applications of a postemergence herbicide to provide season long control. However, on sites without a history of crabgrass invasion this method makes sense because it allows the turf

manager to spot treat the infested areas thus saving chemical cost versus traditional blanket applications. This approach also would have been more cost effective if used in 1988.

An important consideration in using any of the strategies which call for the use of fenoxaprop (Acclaim) is the antagonism caused by several of the commonly used broadleaf herbicides (Table 2). If a combination of a postemergence broadleaf and fenoxaprop is required, then the user will have to develop their own broadleaf mix because all of the standard broadleaf package mixes contain 2,4-D as an essential component. Data in table 2 shows that 2,4-D is the most strongly antagonistic of any of the commonly used turf herbicides. Dicamba, MCPP and chlorflurenol show little to no antagonism while triclopyr and 2,4-DP show some antagonism with fenoxaprop but at a level which could be tolerated. Tank mixing fenoxaprop with a combination of these five broadleaf herbicides would result in good broadleaf and grass control.

Table 3 displays the currently available preemergence herbicides plus two that are expected to be available in 1990. Prodiamine is a dinitroaniline type herbicide (i.e. structure is similar to pendimethalin and benefin) that is expected to be marketed under the trade name Barricade® by Sandoz Crop Protection Co. This is an excellent grass herbicide with a long soil residual. Single applications of prodiamine at 0.5 to 0.75 lb AI/A should be expected to give season long control of crabgrass. A potential drawback of prodiamine is that it does not seem to control some of the important summer annual weeds such oxalis and prostrate spurge.

Another promising new herbicide planned to be released in 1990 is Monsanto's Dimension®. This is an interesting new herbicide because it is not only an excellent preemergence herbicide but it also has significant postemergence grass activity. Dimension can control crabgrass postemergence when the crabgrass is in the one leaf to one tiller growth stage. As the crabgrass develops beyond one tiller in size, Dimension begins to lose its effectiveness. Research is being conducted to determine if the postemergence activity can be increased. Dimension appears to have some activity on broadleaf weeds but its activity on specific weeds such as oxalis and spurge has not yet been well documented.

The next several years will see the introduction of several new herbicides with the potential for changing the approaches taken for annual grass control. Much research and testing lies ahead and while a weed like crabgrass can never be eradicated, the new herbicides will provide superior control compared to what is currently in the marketplace.

TABLE 3. PREEMERGENCE GRASS HERBICIDES

<u>Common Name</u>	<u>Trade Name</u>
BENEFIN	BALAN
BENSULIDE	BETASAN, PRESAN, ETC
DCPA	DACTHAL
SIDURON	TUPERSAN
OXADIAZON	RONSTAR
PENDIMETHALIN	PREM, WEEDGRASS CONTROL
BENEFIN + TRIFLURALIN	TEAM
PRODIAMINE	BARRICADE (1990)
DITHIOPYR	DIMENSION (1990)

TABLE 1: FENOXAPROP (ACCLAIM) AND PENDIMETHALIN COMBINATIONS ON A TIMING SCHEDULE FOR CONTROLLING CRABGRASS. (FAIRWAY DRIVING RANGE, OKEMOS, MI)

TREATMENTS	RATE (LB/A)	"PERCENT CRABGRASS GROUNDCOVER"						
		5-15	5-30	6-15	6-30	7-14	7-29	8-27
1. UNTREATED #	--	0.0	0.7	1.0	0.7	2.7	8.0	30.0
2. ACCLAIM	0.04	0.0	1.0	1.7	1.7	3.0	8.3	41.0
3. ACC. + PEND @	0.04 + 1.5	0.0	0.0	0.0	0.0	0.3	0.3	0.3
4. ACCLAIM	0.06	0.0	1.0	1.3	1.3	1.7	18.0	34.0
5. ACC. + PEND	0.06 + 1.5	0.0	0.3	0.3	0.3	0.3	0.0	4.7
6. ACCLAIM ##	0.06		1.0	1.7	1.7	3.0	6.0	40.0
7. ACC. + PEND	0.06 + 1.5		0.7	1.0	0.0	0.0	0.3	2.0
8. ACCLAIM	0.08		0.3	0.7	1.3	1.7	3.7	23.3
9. ACC. + PEND	0.08 + 1.5		0.3	0.7	0.0	0.0	0.7	0.7
10. ACCLAIM \$	0.08			0.7	0.7	1.7	2.0	31.7
11. ACC. + PEND	0.08 + 1.5			0.7	0.7	2.0	5.3	15.3
12. ACCLAIM	0.12			1.7	1.3	7.3	4.7	55.0
13. ACC. + PEND	0.12 + 1.5			0.3	0.0	1.3	2.0	5.0
14. ACCLAIM \$\$	0.12				0.7	1.0	2.0	3.3
15. ACC. + PEND	0.12 + 1.5				0.0	1.0	1.0	0.7
	LSD (0.05)=	--	0.7	1.4	1.1	2.8	9.1	23.5

# TREATMENTS 1-5 APPLIED ON 5-15-87.

## TREATMENTS 6-9 APPLIED ON 5-30-87.

\$ TREATMENTS 10-13 APPLIED ON 6-15-87.

\$\$ TREATMENTS 14-15 APPLIED ON 6-30-87.

° THE FORMULATION OF PENDIMETHALIN USED WAS 60 WDG.

TABLE 2: FENOXAPROP (ACCLAIM) AND TRIDIPHANE (XRM-4763) IN COMBINATION WITH BROADLEAF HERBICIDES APPLIED TO A KENTUCKY BLUEGRASS/ PERENNIAL RYEGRASS TEE ROUGH AT CLIO COUNTRY CLUB, CLIO MI, ON 8-4-87. (DIGITARIA GROWTH STAGE = 4 LEAF, 5 TO 10 TILLERS.)

TREATMENTS	RATE (LB/A)	PERCENT DIGITARIA CONTROL		
		2 WAT	4 WAT	6 WAT
1. ACC + BROM + 2,4-D E	.18 + 1.0 + .25	21	18	45
2. ACC + TURFLON D	.18 + .375	24	32	43
3. ACC + TRIMEC#	.18 + 1.0	3	1	0
4. ACC + 2,4-DP	.18 + 1.0	18	31	37
5. ACC + CLOPYRALID	.18 + .25	0	21	49
6. ACCLAIM	.18	21	64	94
7. ACC + 2,4-D ESTER	.18 + 1.0	2	2	6
8. ACC + DICAMBA	.18 + .50	22	40	59
9. ACC + FLUROXYPYR	.18 + .50	59	80	75
10. ACC + BROMOXYNIL	.18 + 1.0	42	28	39
11. ACC + MCP	.18 + 1.0	14	56	81
12. ACC + DPX-L5300	.18 + .75	11	6	44
13. ACC + CHLORFLURENOL	.18 + .125	31	52	69
14. ACC + TRICLOPYR	.18 + .50	11	34	40
15. ACC + 2,4-D ESTER	.35 + 1.0	13	10	16
16. ACC + DICAMBA	.35 + .50	41	51	68
17. ACC + FLUROXYPYR	.35 + .50	67	100	99
18. ACC + BROMOXYNIL	.35 + 1.0	18	13	10
19. ACC + MCP	.35 + 1.0	24	65	96
20. ACC + TRIMEC	.35 + 1.0	38	37	42
21. ACC + DPX-L5300	.35 + .75	0	1	9
22. ACC + CHLORFLURENOL	.35 + .125	44	68	75
23. ACC + TRICLOPYR	.35 + .50	52	63	76
24. ACC + CLOPYRALID	.35 + .25	49	72	90
25. ACCLAIM	.35	38	60	91
26. XRM-4763	1.0	2	10	35
27. XRM + 2,4-D ESTER	1.0 + 1.0	2	2	29
28. XRM + DICAMBA	1.0 + .50	2	20	56
29. XRM + FLUROXYPYR	1.0 + .50	8	13	38
30. XRM + BROMOXYNIL	1.0 + 1.0	46	55	88
31. XRM + MCP	1.0 + 1.0	6	3	33
32. XRM-4763	2.0	5	6	28
33. XRM + 2,4-D ESTER	2.0 + 1.0	1	26	72
34. XRM + DICAMBA	2.0 + .50	3	7	26
35. XRM + FLUROXYPYR	2.0 + .50	3	25	56
36. XRM + BROMOXYNIL	2.0 + 1.0	55	45	45
37. XRM + MCP	2.0 + 1.0	2	10	45
38. 2,4-D ESTER	1.0	0	0	3
39. DICAMBA	.50	2	4	14
40. FLUROXYPYR	.50	0	0	0
41. BROMOXYNIL	1.0	5	5	30
42. MCP	1.0	0	0	2
43. DPX-L5300	.75	0	0	21
44. CHLORFLURENOL	.125	0	0	16
45. TRIMEC	1.0	2	0	7
46. TRICLOPYR	.50	0	0	0
47. ACC \$ + TRIMEC	.25 + 1.0	0	1	4
48. ACC \$ + TRIMEC	.35 + 1.0	11	23	29
49. CLOPYRALID	.25	0	0	3
50. CONTROL	---	5	3	7
		LSD(0.05) = 36	40	45

# 1.0 LB/A RATE SIGNIFIES THE 2,4-D PORTION OF TRIMEC.

\$ 1984 FORMULATION OF FENOXAPROP.