ANNUAL WEED CONTROL IN SILAGE AND GRAIN CORN

Prasanta C. Bhowmik
Department of Plant and Soil Sciences
University of Massachusetts

Fall panicum (Panicum dichotomiflorum Michx) and large crabgrass [Digitaria sanguinalis (L.) Scop.] are the dominant annual grass species in the Connecticut Valley. Although various herbicides are available for controlling these speices, there is a need to test these materials under local conditions. The objectives of the experiment were to (i) evaluate the efficacy of the herbicides, (ii) identify crop injury, and finally (iii) determine silage, grain and ear yields of corn.

The experiment was conducted in 1982 at the Agricultural Experiment Station, South Deerfield. The area was heavily infested with fall panicum and large crabgrass. There was also a uniform but light infestation of common lambsquarters, redroot pigweed, common ragweed, and carpetweed. All treatments were applied with a backpack CO_2 sprayer at 22 psi in 40 gal/ac. Preplant incorporated (PPI) treatments were applied May 18 and incorporated immediately in one direction with a disc. Corn (Agway 584S) was planted in 36-inch rows on May 19, 1982. Premergence treatments were applied May 21. Early postemergence (EP) treatments were applied June 9 when grass weeds were at the 2-3 leaf stage, corn was at the 3-4 leaf stage, and broadleaf weeds were at the second pair true leaf stage. Experimental design was a randomized complete block with three replications. Treatments were separated by LSD at the 5% level of significance.

Plot size was 10 by 20 feet and each plot contained 3 rows of corn. Corn phytotoxicity was usually rated on a scale of 0 to 100% on June 15, 1982. Weed control ratings (0 to 100%) were made on June 15 and July 12, 1982. Corn was harvested on September 29, 1982. One row of corn was used for silage, while the other row was harvested for ear corn and grain yield determination.

Herbicide treatments shown in Table 1 provided excellent grass and broadleaf weed control. Treatments of alachlor or metolachlor at 1.5 lb/ac in combination with dicamba at 0.25 lb/ac showed slight phytotoxicity to corn. No other corn injuries were observed. Preplant incorporated treatments of butylate + R-25788 or EPTC + R-25788 in combination with atrazine or cyanazine gave season long control of fall panicum and crabgrass. This resulted in the highest silage, ear, and grain yield of corn. Both grass and broadleaf weed control was excellent with either alachlor or metolachlor in combination with either atrazine or cyanazine. Silage, ear, and grain yields of corn were good with these treatments. Silage yields from the plots treated with the combination of alachlor or metolachlor and bentazon or dicamba II, were not significantly higher compared to that of check plots.

The early postemergence treatment of cyanazine or atrazine at 2.5 lb/ac was as effective as any other treatment combinations of preemergence and early postemergence (treatment no. 14, 15, 16, 17, 19 and 20). All treatments applied in preemergence followed by early postmeergence gave excellent control of both annual grass and braodleaf weeds. In general, most of the herbicides tested either alone or in combination are safe and can be used for successful weed control program in corn in Massachusetts.

Table 1 Performance of Various Herbicides on Injury, Weed Control, and Silage, Ear and Grain Yield of Corn

	Treatment	Rate	Method of Application	Corn Injury	Weed Control[a] June 15 GR	Weed Control[a] June 15 BL	Weed Control[a] July 12 GR	Weed Control[a] July 12 BL	Corn Yield Silage	Corn Yield Ear	Corn Yield Grain
		(lb/ac)		(%)	------- % -------				(tons/ac)		(bu/ac)
1.	Butylate + R-25788 + Atrazine	4.0 + 1.0	PPI	0.0	97	97	100	95	28.6	3.6	94.3
2.	Butylate + R-25788 + Cyanazine	4.0 + 1.5	PPI	0.0	100	98	100	95	26.6	3.2	83.6
3.	EPTC + R-25788 + Atrazine	4.0 + 1.0	PPI	0.0	100	100	100	100	25.0	2.9	75.7
4.	EPTC + R-25788 + Cyanazine	4.0 + 1.0	PPI	0.0	95	90	95	85	21.9	2.6	66.6
5.	Untreated Check	-	-	0.0	0	0	0	0	10.8	1.2	33.3
6.	Alachlor + Atrazine	1.5 + 1.0	Pre	0.0	95	100	95	100	18.6	2.1	54.2
7.	Metolachlor + Atrazine	1.5 + 1.0	Pre	3.3	95	100	100	100	20.7	2.5	63.0
8.	Alachlor + Cyanazine	1.5 + 1.5	Pre	1.7	95	100	100	100	20.7	2.4	62.0
9.	Metolachlor + Cyanazine	1.5 + 1.5	Pre	0.0	100	97	100	95	23.3	2.6	67.9
10.	Pendimethalin + Atrazine	1.5 + 1.25	Pre	3.3	98	100	100	100	24.7	2.9	73.5
11.	Cyanazine + Atrazine	2.0 + 1.0	Pre	0.0	95	100	95	100	19.7	2.2	56.9
12.	Cyanazine	2.5	EP	5.0	100	100	100	100	21.2	2.5	63.0
13.	Atrazine[b]	2.5	EP	0.0	98	100	100	100	25.0	2.9	76.4
14.	Alachlor + Dicamba	1.5 + 0.25	Pre + EP	31.7	100	100	100	100	21.4	2.5	64.1
15.	Metolachlor + Dicamba	1.5 + 0.25	Pre + EP	23.2	97	98	95	95	20.0	2.5	63.6
16.	Alachlor + Bentazon[b]	1.5 + 1.0	Pre + EP	0.0	88	98	85	95	17.1	1.9	49.8
17.	Metolachlor + Bentazon[b]	1.5 + 1.0	Pre + EP	0.0	90	93	80	80	14.1	1.8	45.5
18.	Untreated Check	-	-	0.0	0	0	0	0	8.5	1.0	23.3
19.	Alachlor + Dicamba-II[c]	1.5 + 0.25	Pre + EP	16.7	98	97	95	100	17.3	1.9	51.3
20.	Metolachlor + Dicamba II[c]	1.5 + 0.25	Pre + EP	21.7	98	100	80	100	16.1	2.1	53.8
	$LSD_{0.05}$			10.6	6	6	7	7	9.0	1.1	29.1

[a] GR = Fall panicum and large crabgrass
BL = Common lambsquarters, redroot pigweed, carpetweed
[b] Oil concentrate used at the rate of 1 qt/ac.
[c] Dicamba II = Sodium salt formulation