

1991 Corn Gluten Meal Crabgrass Control Study - Year 16-2006

Nick Christians and Christopher J. Blume

Corn gluten meal (CGM) has been screened for efficacy as a natural herbicide and fertilizer for turf on the same plot since 1991. The study is being conducted at the Iowa State University Research Station north of Ames, IA on 'Parade' Kentucky bluegrass established on a Nicollet (fine-loamy, mixed, mesic Aquic Hapludolls) soil.

Experimental plots are 5 x 5 ft and there are five treatments with three replications. The experimental design is a randomized complete block. Corn gluten meal is applied once per year in April to the same plots at 0, 20, 40, 60, 80, 100, and 120 lbs per 1000 ft² (Table 1). Because corn gluten meal is 10% N, these rates are equivalent to 0, 2, 4, 6, 8, 10, and 12 lb N per 1000 ft². CGM is applied each year in a single early-spring preemergence application using 'shaker dispensers' and watered-in with the irrigation system. Supplemental irrigation provides adequate moisture to maintain grass in good growing condition. Applications were made on April 27, 2006.

Turf quality was monitored from May through September (Table 1). It was assessed using a 9 to 1 scale with 9 = best, 6 = lowest acceptable, and 1 = worst turf quality.

Weed populations were measured by either counting the number of plants or by estimating the percentage cover per individual plot. Crabgrass infestations were determined by counting the number of plants per individual plot on August 2 and August 31 (Table 2). Dandelion populations were assessed by counting the number of plants per individual plot (Table 3). Clover populations were determined by estimating the percentage area of each plot covered by clover (Table 4).

Data were analyzed with the Statistical Analysis System (SAS) and the General Linear Model (GLM) procedure. Effects of CGM on turf quality and weed control were examined using Fisher's Least Significant Difference (LSD) means comparison tests.

Table 1. Visual quality¹ of Kentucky bluegrass treated in the 1991 Corn Gluten Meal Weed Control Study.

	Material	lbs CGM /1000 ft ²	lbs N /1000 ft ²	May 12	May 31	June 30	July 31	August 31	Sept. 30
1	Untreated control	0	0	9	2	2	4	3	2
2	Corn gluten meal	20	2	9	3	4	5	5	4
3	Corn gluten meal	40	4	9	5	6	7	7	6
4	Corn gluten meal	60	6	9	5	6	8	7	8
5	Corn gluten meal	80	8	9	5	5	6	8	8
6	Corn gluten meal	100	10	9	6	6	6	7	7
7	Corn gluten meal	120	12	9	7	8	7	8	8
LSD_{0.05}				NS	2.2	2.3	2.3	1.7	1.6

¹Turf quality was assessed using a 9 to 1 scale with 9 = best, 6 = lowest acceptable, and 1 = worst turf quality.
NS = means are not significantly different at the 0.05 level.

Table 2. Crabgrass counts¹ in Kentucky bluegrass treated in the 1991 Corn Gluten Meal Weed Control Study.

	Material	lbs CGM /1000 ft ²	August 2	August 31
1	Untreated control	0	103	42
2	Corn gluten meal	20	43	21
3	Corn gluten meal	40	2	2
4	Corn gluten meal	60	5	3
5	Corn gluten meal	80	1	0
6	Corn gluten meal	100	6	3
7	Corn gluten meal	120	2	2
LSD_{0.05}			44.5	14.0

¹Values represent the number of crabgrass plants per plot covered.
NS = means are not significantly different at the 0.05 level.

Table 3. Dandelion counts¹ in Kentucky bluegrass treated in the 1991 Corn Gluten Meal Weed Control Study.

	Material	lbs CGM /1000 ft ²	May 12	May 31	June 30	July 31	August 31	Sept. 30
1	Untreated control	0	39	43	43	47	57	56
2	Corn gluten meal	20	16	28	18	20	24	35
3	Corn gluten meal	40	1	2	0	1	2	14
4	Corn gluten meal	60	1	1	1	1	1	1
5	Corn gluten meal	80	1	0	0	0	0	0
6	Corn gluten meal	100	2	2	1	1	2	2
7	Corn gluten meal	120	0	0	1	0	0	0
LSD_{0.05}			14.4	21.6	17.5	21.0	18.9	22.6

¹Values represent the number of dandelion plants per plot.

Table 4. Percentage clover cover¹ in Kentucky bluegrass treated in the 1991 Corn Gluten Meal Weed Control Study.

	Material	lbs CGM /1000 ft ²	May 12	May 31	June 30	July 31	August 31	Sept. 30
1	Untreated control	0	20	17	12	2	1	4
2	Corn gluten meal	20	20	10	11	1	1	1
3	Corn gluten meal	40	12	17	9	2	2	2
4	Corn gluten meal	60	18	27	17	2	2	2
5	Corn gluten meal	80	37	43	38	19	7	11
6	Corn gluten meal	100	31	32	25	17	10	12
7	Corn gluten meal	120	12	7	3	2	3	4
LSD_{0.05}			NS	NS	NS	NS	6.1	7.5

¹Values represent the area per plot covered by clover.

NS = means are not significantly different at the 0.05 level.