1991 Corn Gluten Meal Crabgrass Control Study - Year 14-2004

Nick Christians and Luke Dant

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 ft^2 (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 ft^2. 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 25, 2004.

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 July 28 and August 27 (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 quality[1] 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 5	May 28	June 29	July 28	August 27	Sept. 28
1	**Untreated control**	0	0	5	4	3	4	4	3
2	**Corn gluten meal**	20	2	6	6	5	5	6	5
3	**Corn gluten meal**	40	4	7	8	6	5	6	7
4	**Corn gluten meal**	60	6	6	8	7	6	6	6
5	**Corn gluten meal**	80	8	7	7	7	7	7	7
6	**Corn gluten meal**	100	10	6	7	7	7	7	7
7	**Corn gluten meal**	120	12	7	8	7	7	8	8
	$LSD_{0.05}$			NS	2	2	1	2	2

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 counts[1] in Kentucky bluegrass treated in the 1991 Corn Gluten Meal Weed Control Study.

	Material	lbs CGM /1000 ft^2	July 28	August 27
1	**Untreated control**	0	16	14
2	**Corn gluten meal**	20	6	5
3	**Corn gluten meal**	40	0	0
4	**Corn gluten meal**	60	0	0
5	**Corn gluten meal**	80	1	1
6	**Corn gluten meal**	100	3	1
7	**Corn gluten meal**	120	0	0
	$LSD_{0.05}$		NS	NS

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

Table 3. Dandelion counts[1] in Kentucky bluegrass treated in the 1991 Corn Gluten Meal Weed Control Study.

	Material	lbs CGM /1000 ft^2	May 5	May 28	June 29	July 28	August 27	Sept. 28
1	**Untreated control**	0	45	34	38	34	36	38
2	**Corn gluten meal**	20	22	21	21	15	18	21
3	**Corn gluten meal**	40	3	1	1	1	1	2
4	**Corn gluten meal**	60	1	1	0	0	1	1
5	**Corn gluten meal**	80	1	0	1	0	0	1
6	**Corn gluten meal**	100	2	1	2	0	0	1
7	**Corn gluten meal**	120	1	0	0	0	0	0
	$LSD_{0.05}$		29	NS	25	NS	NS	24

[1]Values represent the number of dandelion plants per plot.

Table 4. Percentage clover cover[1] in Kentucky bluegrass treated in the 1991 Corn Gluten Meal Weed Control Study.

	Material	lbs CGM /1000 ft^2	May 5	May 28	June 29	July 28	August 27	Sept. 28
1	**Untreated control**	0	12	23	28	33	29	31
2	**Corn gluten meal**	20	5	6	10	22	15	21
3	**Corn gluten meal**	40	4	6	7	12	7	8
4	**Corn gluten meal**	60	7	4	4	4	4	5
5	**Corn gluten meal**	80	4	9	5	8	7	4
6	**Corn gluten meal**	100	8	9	14	20	17	11
7	**Corn gluten meal**	120	3	2	3	5	2	3
	$LSD_{0.05}$		NS	NS	NS	NS	NS	NS

[1]Values represent the area per plot covered by clover.
NS = means are not significantly different at the 0.05 level.