

1999 Corn Gluten Meal/Urea Crabgrass Control Study - Year 7-2005

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This study was initiated in 1999 to determine if the levels of annual grass and broadleaf weed control provided by corn gluten meal (CGM) treatments can be explained by the nitrogen response of treated bluegrass and not herbicidal activity of CGM. The study is being conducted at the Iowa State University Research Station north of Ames, IA in an area of 'Parade' Kentucky bluegrass. The soil in this experimental area is a Nicollet (fine-loamy, mixed, mesic Aquic Hapludolls) with an organic matter content of 4.2%, a pH of 6.75, 17 ppm P, and 103 ppm K.

The experimental design is a randomized complete block with three replications. Individual experimental plots are 5 x 5 ft with five treatments. Corn gluten meal and urea are applied yearly to the same plots at an annual rate of 4 lbs N/1000 ft² (Table 1). Treatments include split applications of 2 lb N/1000 ft² and four applications of 1 lb N/1000 ft² each. The CGM and urea are applied using cardboard containers as 'shaker dispensers'. The materials are watered-in with the irrigation system. Supplemental irrigation is used to provide adequate moisture to maintain the grass in good growing condition. In 2004, initial applications of all urea and CGM treatments were made on April 21. Sequential applications of 1 lb N/1000 ft² were made on June 3, August 15, and September 17. The second applications of 2 lb N/1000 ft² for urea and CGM (Treatment 3 and 5) were made on August 15.

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

Crabgrass data represent the number of plants per individual plot. Crabgrass counts were made on July 27 and August 27 (Table 2).

Broadleaf weed populations were measured by either counting the number of plants or estimating the percentage cover per individual plot. Data for dandelion and clover were taken beginning in May and ending in September. Dandelion infestations were determined by counting the number of plants per individual plot. Clover populations were estimated by assessing the percentage area of each plot covered by clover.

Data were analyzed with the Statistical Analysis System (SAS) and the General Linear Model (GLM) procedure. Effects of CGM and urea on bluegrass 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 N /1000 ft ²	Number of applications	May 9	May 26	June 30	July 27	August 27	Sept. 28
1 Untreated control	NA	NA	4	4	5	4	4	4
2 Corn gluten meal	4	4	5	5	6	5	5	5
3 Corn gluten meal	4	2	5	6	5	5	7	6
4 Urea (46-0-0)	4	4	5	6	5	4	5	5
5 Urea (46-0-0)	4	2	4	5	5	4	4	4
LSD_{0.05}			NS	NS	NS	NS	NS	NS

¹Visual 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 1999 Corn Gluten Meal/Urea Weed Control Study.

Material	lbs N /1000 ft ²	Number of applications	July 27	August 27
1 Untreated control	NA	NA	32	33
2 Corn gluten meal	4	4	17	18
3 Corn gluten meal	4	2	22	30
4 Urea (46-0-0)	4	4	50	42
5 Urea (46-0-0)	4	2	33	40
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 counts¹ in Kentucky bluegrass treated in the 1999 Corn Gluten Meal/Urea Weed Control Study.

	Material	lbs N /1000 ft²	Number of applications	May 9	May 26	June 30	July 27	August 27	Sept. 28
1	Untreated control	NA	NA	14	21	16	11	26	21
2	Corn gluten meal	4	4	12	17	9	10	21	16
3	Corn gluten meal	4	2	12	12	13	10	15	15
4	Urea (46-0-0)	4	4	9	10	10	4	14	12
5	Urea (46-0-0)	4	2	11	14	7	6	17	12
LSD_{0.05}				NS	NS	NS	NS	NS	NS

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

Table 4. Percentage clover cover¹ in Kentucky bluegrass treated in the 1999 Corn Gluten Meal/Urea Weed Control Study.

	Material	lbs N /1000 ft²	Number of applications	May 9	May 26	June 30	July 27	August 27	Sept. 28
1	Untreated control	NA	NA	35	28	21	17	30	17
2	Corn gluten meal	4	4	19	17	16	14	20	19
3	Corn gluten meal	4	2	15	14	12	10	7	8
4	Urea (46-0-0)	4	4	19	12	25	20	30	26
5	Urea (46-0-0)	4	2	27	30	24	30	35	32
LSD_{0.05}				NS	NS	NS	NS	NS	NS

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