Natural Organic Source Study

Iowa State University 1993
M. L. Agnew

Objective: The objective of this study is evaluate the effects of different natural organic nitrogen sources on Kentucky bluegrass growth.

Treatments: Treatments included 6 natural organic nitrogen sources and a non-fertilized control. Nitrogen sources includes: blood meal, corn gluten meal, leather meal, composted turkey manure (Sustane), composted chicken manure, and activated sewage sludge. One lb N applications were made on May 27, July 1, and August 15, 1993. Treatments were made on newly established 'Bronco' Kentucky bluegrass mowed at 2 inches and irrigated to prevent drought.

Data Collected: Plots were rated for quality in June, July, August, and September. Visual quality is measure on a scale of 1 to 9, with 1 = brown turf, 9 = lush green turf, and 6 = the minimum acceptable level. Clippings were collected from a 2 X 5 ft area, in June, July, August, September, and October. Clippings were oven dried, weighed and reported as grams of dried tissue per 10 ft^2. Roots were collected in November of 1993. These were segmented into 4 depths, washed and oven dried, then reported as grams of root tissue per depth.

Results: Composted chicken manure produced the best quality turf followed by composted turkey manure (Sustane), corn gluten meal, and blood meal (Table 1).

Composted chicken manure produced over 100% more clippings than any other nitrogen source (Table 2), while it produced the least amount of roots (Table 3). The free ammonia in chicken manure obviously benefited shoot growth, however, it was also aided by record rainfalls that negated any potential ammonia toxicity. This was noted in previous natural organic nitrogen trials.

This study will be repeated in 1994 to validate the data.

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Table 1. The influence of organic nitrogen source on turfgrass quality.

	June			July			August			Sept.	
Fertilizer Source	11	17	30	12	23	27	6	17	27	7	Avg.
Blood Meal	4	6	8	8	8	8	9	7	7	8	7
Corn Gluten Meal	5	6	8	7	8	7	8	7	7	8	7
Leather Meal	5	6	5	6	7	6	7	7	7	6	6
Sustane	6	7	7	7	7	7	7	6	7	7	7
Chicken Manure	7	8	9	9	9	7	8	7	9	9	8
Sewage Sludge	5	6	6	6	6	7	7	7	7	7	6
Control (0)	4	4	4	4	4	4	5	6	5	5	5
$LSD_{(0.05)}$	1.5	0.8	0.9	0.5	0.8	0.7	0.9	NS	1.1	1.0	0.3

Table 2. The influence of organic nitrogen source on turfgrass clipping production.

	June			July		August			Sept.	Oct.	
Fertilizer Source	17	24	30	12	27	6	17	27	17	22	Total
Blood Meal	3.5	3.9	5.1	17.8	14.8	13.0	11.9	10.5	13.0	10.1	103.5
Corn Gluten Meal	4.6	7.3	7.7	17.0	14.6	10.6	10.3	8.6	12.2	14.1	107.0
Leather Meal	4.0	2.9	3.0	8.3	8.8	7.3	7.4	6.7	9.5	6.8	64.6
Sustane	7.8	6.9	6.3	15.9	13.1	9.8	14.4	13.4	13.6	11.5	112.7
Chicken Manure	48.2	29.7	21.1	51.7	20.4	16.3	6.3	31.0	25.7	25.7	275.9
Sewage Sludge	4.9	3.8	3.3	7.1	8.8	6.5	7.7	9.8	10.9	8.4	71.1
Control (0)	2.0	1.3	1.3	1.5	1.8	1.8	4.8	2.5	4.0	2.7	23.7
$LSD_{(0.05)}$	4.9	2.5	1.7	4.8	4.0	2.9	6.0	4.4	1.9	2.7	15.8

Table 3. The influence of organic nitrogen source on turfgrass rooting.

	Depth (cm)				
Fertilizer Source	0 – 5	5 – 10	10 – 15	15 – 20	Total
Blood Meal	47.5	22.7	14.2	7.7	92.2
Corn Gluten Meal	67.7	20.9	12.5	7.7	108.5
Leather Meal	49.3	25.2	14.3	9.2	98.0
Sustane	70.8	21.6	16.4	9.4	118.2
Chicken Manure	46.6	20.5	13.4	6.9	87.4
Sewage Sludge	74.5	26.5	16.4	6.6	123.9
Control	70.2	24.6	14.0	8.0	116.8
$LSD_{(0.05)}$	21.9	NS	NS	NS	NS