Natural Organic Source Evaluation on a Kentucky Bluegrass-Perennial Ryegrass Mixture-1996[1]

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Introduction

Good turfgrass growth is dependent on an adequate supply of all the essential nutrients, as well as other environmental and cultural factors. Of the essential nutrients, nitrogen is the element that receives the most attention in turfgrass fertilization programs. One reason for emphasis on nitrogen is that turfgrasses give a good color and growth response to nitrogen. The color and growth response from nitrogen is usually more dominant than any other element. The behavior of nitrogen, in both the plant and soil, places it in the unique position of being the "growth control" element. Supplies of other nutrients are kept at adequate levels and the manager regulates growth and color by adding or withholding nitrogen. Thus, fertilization strategies for turfgrass are primarily designed around nitrogen.

A number of nitrogen containing fertilizers is presently available in the marketplace for turfgrass fertilization: water soluble or quickly available and water insoluble or slowly available. These nitrogen fertilizers vary considerably in their chemical and physical properties. Slowly available sources such as urea formaldehyde (UF), milorganite, isobutylene di-urea (IBDU), methylene urea and sulfur-coated urea have been available for years. Several new slowly available nitrogen sources have more recently emerged into the turfgrass marketplace. These are the polymer-coated urea and polymer-coated, sulfur coated urea. Evaluation of these latter sources is provided in several other research reports available from the authors. **More recently an interest has developed in the use of natural organic and natural organic-based fertilizers for turf grass fertilization programs. The purpose of this research investigation is to evaluate the performance of a number of these later nitrogen sources.**

Discussion/Summary

Several organic and natural organic-based nitrogen fertilizers at various application rates were compared for color/quality responses (Table 1) and clipping yields (Table 2) for a 16-week period after initial fertilizer application. This fertilizer trial is the second year evaluation of a two-year study initiated in 1995. The nitrogen fertilizer sources were applied on May 23, 1996. One (1 N) and two (2 N) pounds of nitrogen per 1,000 square feet were applied with each fertilizer source. Nitrogen fertilizer applications were made by hand onto a six-screen mesh fertilizer distribution flow box. Each treatment was replicated three times in a randomized complete block design using 3 x 10 feet plots. Mowing was performed at a two-inch height and clippings were collected throughout the growing season. Clipping yield was based on one complete swath across the center of each plot with a 22-inch Lawn Boy rotary mower. Clippings were bagged, dried at 60 degrees C for 72 hours, and then weighed to provide dry matter yields. Turf grass color/quality ratings were taken at 10 to 12 day intervals and based on a scale of 1 to 9 with one representing poorest and 9 representing best. Irrigation was performed as needed to prevent wilt.

Seasonal performance rankings are provided in Figures 1-3. Performance rankings are simply the number of times a fertilizer source scores a color/quality rating over the 16-week evaluation above the designated rating value (i.e. $\geq$6.0 & $\geq$7.0).

Turf grass Quality

Nitrogen fertilizer applications were made on May 23, 1996. Unfertilized turf grass consistently showed poorer color/quality than the fertilized turf grass throughout most of the rating period (Table 1). Urea provided the significantly better initial color/quality responses than any of the other

nitrogen fertilizer sources. Triplex V and Scotts All Natural were the only two natural organic-based nitrogen fertilizer sources to provide acceptable color/quality responses (i.e.≥6.0) at the 1 N rate within one week after fertilizer application (5-30)(M-1000ft.²). As in 1995, color/quality responses from all the nitrogen sources at the 1 N/M rate can be characterized as relatively slow initially compared to urea. **Several of the natural organic nitrogen sources did provide acceptable color/quality responses at the 1 N/M rate at two weeks after application. At the 2N/M rate, initial color quality responses were significantly better with the majority of nitrogen sources**.

Turf grass color/quality ratings throughout the spring and summer rating periods were similar among the better performing natural organic nitrogen sources at the 1N/M rate. These natural organic nitrogen sources, in general, exhibited a slow initial response, fair intermediate response, and a fair to poor residual response. Turf grass color/quality ratings at the 1 N/M rate for ratings much above marginally acceptable (i.e. all ratings of ≤7.0). **In fact, only urea and Nature Pure provided color/quality ratings of 7.0 at certain rating dates during the season at the 1 N/M rate. Nature Pure provided the best residual responses at the 1N/M rate (8-9 weeks residual).** These latter color/quality responses were similar to those reported in 1995. Urea performance in 1996 was however significantly lower than in 1995. Intermediate and residual color/quality responses from urea were unacceptable at the 1 N/M rate.

The higher nitrogen rate (2 N/M) consistently outperformed the lower nitrogen rate across all nitrogen fertilizer sources throughout the rating period (Table 1 and Figures 2-3). **Urea, TurfPlex V, Nature Pure, and Scotts All Natural provided the best overall performance among all the nitrogen fertilizer sources at the 2N/M rate. Scotts All Natural, Nature Pure, Nature Safe, and Nutralene all provided the best residual color/quality responses (residual rating of 6.0-6.5) for twelve to thirteen weeks.** These latter four nitrogen sources provided similar residual color/quality responses to those 1995. Seasonal performance ranking (Figure 2-3) indicate Scotts All Natural, Turf Plex VI, Nature Pure, Nature Safe, and Nutralene providing the best performance at the 2 N/M rate. Nutriganics, Natural Organic 1, and Com-til seldonm provided an acceptable response even at the 2N/M rate. Many of the natural organic sources outperformed urea based on overall seasonal performance at the 2N/M rate.

Growth/Clipping Yield

Growth/clipping yields taken at ten to twelve day intervals throughout the rating period are provided in Table 2. The unfertilized turfgrass consistently provided the lowest growth/clipping yield when compared to all the nitrogen sources and rates. Generally, there was a trend throughout the rating period for higher growth/clipping yields for the 2N/M rate compared to the 1N/M rate. These latter rate differences were more dramatic in the first 4-6 weeks after fertilizer application. Urea produced the highest initial growth/clipping yields in the first one to two weeks after fertilizer application (i.e. 5-31). Growth/clipping yields were also somewhat higher in the first few weeks after fertilizer application from Scotts All Natural, Turf Plex V, Turf Plex VI, and Nature Pure. Those nitrogen sources exhibiting better color/quality in the intermediate response period generally provided slightly higher growth/clipping yields. Also, those nitrogen sources providing better growth/clipping yield consistently out yielded urea during the intermediate and residual periods at both nitrogen rates. Growth/clipping yields from Nutriganics, Natural Organic 1, and Com-til was seldom better than the untreated turfgrass.

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