IRON SOURCES

A Summary Of Research On New Iron Products For Turfgrass
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In the recent past, new sources of iron (Fe) have become available for use by turfgrass managers. In general, these new sources are accompanied by an organic component which limits their immediate solubility and reaction with the soil. By limiting the solubility, the potential availability of the Fe to turfgrasses can be extended, particularity in high pH soils. Since most golf-green soils and many of the home lawns in Florida are neutral to alkaline in pH, these new Fe sources potentially play an important role in overcoming Fe deficiencies in turfgrasses.

Fe-Sucrate: These new Fe sources can be divided into two general types. One is an Fe-Sucrate which is manufactured using heat and molasses to form an organic complex containing Fe which has a limited water solubility. Tests have shown that only approximately 4–5% of the Fe in the compound is water soluble.

It is so water insoluble that it does not stain when accidently applied to sidewalks and driveways. This material was compared with other Fe sources in a glasshouse study using centipedegrass as the test crop. Acid-washed sand media was maintained at pH 8.0 and the equivalent of 20 lbs. of Fe per acre was applied, except Fe-EDTA was applied at 5 lbs. Fe per acre. Fe-Sucrate and Fe-EDTA produced the largest amount of growth, whereas centipede growth in the presence of Ironite, Iron Sulfate, Iron Oxide, and OxySulfate were no different from the control treatment. Centipede tissue Fe concentration followed the same trend as dry matter production.

Top, iron source effects on centipedegrass. Middle, reduced nitrogen and Fe-Humate resulted in similar or better quality turfgrass, than turfgrass receiving higher nitrogen rates alone. Bottom left, response of a modified iron Fe-Humate source on turfgrass quality in the field. Bottom right, plots receiving iron plus 6–7% nitrogen had a better transition to bermudagrass.

Fe-Humate: Tampa waste water treatment facility uses ferric acid to precipitate fulvic and humic acids to produce potable water. The organic precipitate, containing 20–25% Fe is registered as Fe-Humate, a complexed Fe source. The product is approximately 32% organic of which approximately 21% is fulvic acid. Solubility in water is near zero. In addition to Fe, the product contains approximately 3.5% sulfur.

Numerous studies have been conducted to evaluate this material as an Fe source for turfgrasses. Degradation studies have revealed that the unmodified Fe-Humate breaks down very slowly compared to other organic N sources, such as cellulose and sewage sludge. When used in the unmodified form, Fe-Humate has been shown to be of limited benefit to turfgrasses in both glasshouse and field studies.

Modified Fe-Humate: Degradation studies revealed that the decomposition rate of Fe-Humate could be increased by adding N to the material. Subsequently, the N content of the Fe-Humate products was increased. Studies with these new modified Fe-Humates containing fortified levels of N have shown positive growth and quality responses by bermudagrass in both glasshouse and field studies.

When applied at 1 lb. per 1,000 sq. ft. every 90 days, the 6-0-0-12 and 7-0-0-8 materials (6-0-0-12, represents 6, 0, 0, and 12%, N, P205, K20, and Fe, respectively) produced a faster growing and higher quality bermudagrass than did Iron Sulfate. A 3-0-0-12 modified Fe-Humate material produced turfgrass quality ratings equivalent to the control treatment receiving an equivalent rate of Iron Sulfate. Based on these studies, it appears that the modified Fe-Humate product needs to contain at least 6% N in order for the material to degrade rapidly enough to produce a positive growth and quality response in turfgrasses.

Nitrogen-modified Fe-Humates were also applied to cool-season ryegrass. A similar growth and quality response was also observed on the ryegrass as a result of the application. However, an additional apparent benefit from the application was also