

IRON APPLICATION - RATES, CARRIERS, & TOXICITY COMPARISONS

The micronutrient most commonly deficient on turfgrass areas is iron. Deficiencies appear as an inter-venial yellowing of the youngest actively growing leaves. Under a continued iron deficiency, the chlorosis spreads to the older leaves and the plants become weakened. An iron deficiency occurs on the youngest leaves while yellowing from a nitrogen deficiency occurs first on the oldest leaves. Iron deficiencies are associated with soils having high calcium and magnesium contents.

Correction of an iron deficiency can be accomplished by a foliar application of ferrous sulfate ammonium sulfate.

Soil applied complete fertilizers with iron and activated sewage sludge materials also contain significant amounts of iron. Reports of problems with foliar burn following applications of water soluble iron as a spray are not uncommon. Thus, this study was initiated during the summer of 1976 to evaluate the effects on the proness to turfgrass phytotoxicity. Four iron sources were utilized in the test: ferrous sulfate, ferrous ammonium sulfate, Chelated 138, and Chelated 330. Rates of application were 0, 4, 8, 12, 16, 20, and 24 pz. of material per 1000 ft.² Applications were made by means of a hand sprayer to four square foot plots. There were three replications utilized in two tests during 1976 and one test during the 1977 growing season. Visual estimates of foliar burn to the bentgrass and bermudagrass were taken along with any positive responses to the iron application.

Results. No foliar burn or noticeable response was observed at the 2 oz. per 1000 ft.² application of iron sulfate to creeping bentgrass. The 4 oz. and 8 oz. rates showed a definite greening response with no foliar burn evident. There was a slight burning at the leaf tips from the 12 oz. rate with the extent of foliar burn becoming greater as the rate of application was increased above this level.

No burning or greening response was noted from the 2 oz. application of ferrous ammonium sulfate. The 4, 8, and 12 pz. rates produced a significant enhancement of green coloration with no foliar burn. However, phytotoxicity was evident at application rates of 16 oz. per 1000 ft.² and above at temperatures of 75 to 80°F. At warmer temperatures of 90 to 94°F, foliar burn from ferrous ammonium sulfate was observed at a rate of 10 oz. and above.

Chelated 138 caused a distinct reddish coloration which persisted on the leaves and was fairly objectionable at application rates of 12 pz. per 1000 sq. ft. and above. Chelated 138 did produce a slight greening at the 2 oz. rate and substantial enhancement of green coloration at 4 oz./11,000 ft.² and above. Foliar burn was first noticed at the 16 oz. rate of application and became progressively more severe as the rate was increased to 24 oz.

Chelated 330 produced a slight greening at the 2 oz. rate with a major enhancement of green color at higher rates similar to that reported for Chelated 138. However a slight foliar burn was evident at the 6 through 14 oz. rates. Objectionable degrees of foliar burn were evident at rates of 14 oz. per 1000 ft.² and above.

Summary. Results from these investigations indicate that foliar burn is occurring at relatively high application rates compared to those commonly in use. Frequent reports of foliar burn at substantially lower rates, suggest that the iron is being applied with the other chemicals, which in combination, are causing foliar

burn. The rate of application at which foliar burn occurred did vary among the four materials and increased as temperatures increased. However with temperatures up to 95°F. on a creeping bentgrass turf, iron applications can be made in the range of a 4 to 8 oz. per 1000 sq. ft. without concern for foliar burn.

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