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FERTILIZERS FOR LAWNS IN THE WINTER GARDEN AREA

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SUMMARY

Fertilizer tests made on a chlorotic St. Augustinegrass lawn at Crystal City from August 1955 through February 1956 showed that special fertilizers containing premixed trace elements were not as effective in producing a healthy green turf as a fertilizer in which the trace elements were mixed with a standard 1-2-1 fertilizer ratio just prior to application.

The trace elements, zinc and iron, in combination with the major elements, nitrogen, phosphorus and potassium produced, the best green-up. Copper, boron and manganese mixed with the major elements did not show any effect.

Chelated forms of zinc and iron were equal to the sulfate forms in the degree of greening, but the chelated forms persisted longer though they were slower acting. It was necessary to apply the sulfate forms more often.

The best treatment was a 1-2-1 fertilizer ratio at the rate of 2 pounds of actual nitrogen per 1,000 square feet, in combination with an iron chelate and a zinc chelate, each at the rate of 1 pound per 1,000 square feet, or in combination with an iron sulfate and a zinc sulfate, each at the rate of 10 pounds per 1,000 square feet.

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Introduction

Keeping a lawn a healthy green color throughout the year is a never-ending problem in the Winter Garden area. To answer some of the fertilization problems involved, a study was conducted from August 1955 through February 1956, on a lawn at Crystal City by the Winter Garden Experiment Station.

Two questions particularly were investigated:

Is a special commercial fertilizer that contains premixed trace elements as effective as a fertilizer that contains the major elements (nitrogen, phosphorus and potassium) and is mixed with the trace elements just prior to application?

Which trace elements and in what form produce the best and longest lasting green-up?

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Experimental Procedure

Soil application of fertilizer materials was made on a chlorotic St. Augustine lawn. This soil, an Orelia clay loam, tested pH 8.0, 2.70 percent organic matter, 95 parts per million phosphoric acid (P_2O_5), and over 240 parts per million potash (K_2O).

The first series of test plots, 3 feet x 15 feet, was laid out on August 8. The next series of treatments was laid out August 19, and consisted of the best treatments found in the first series plus new combinations. This same procedure of repeating the best treatments from the previous test and adding new combinations was followed in treatments applied August 29, October 13 and December 22.

The major elements in a complete fertilizer were mixed with the trace elements in various combinations, ranging from one major element with one trace element to a mixture that contained all of them. A total of 77 combinations were studied.

The major element fertilizer materials used were: ammonium nitrate (33.0 percent N), ammonium sulfate (20.5 percent N), calcium cyanamid (21.5 percent N), urea (45.0 percent N), 16-20-0, 13-39-0, 6-12-6, 5-10-5 and 12-12-6. Fertilizer materials premixed with trace elements were used in 5-10-5 and 12-12-6 ratios. All fertilizer materials were applied at the rate of 2 pounds of actual nitrogen per 1,000 square feet.

The trace-element materials used were: sulfate forms of copper, manganese, iron and zinc; fertilizer borate (10.5 percent B); Sequestrene chelating complexes (sodium ethylenediamine tetra-acetic acid) of iron (12 percent metallic); zinc (14 percent metallic); copper (13 percent metallic); manganese (12 percent metallic); Chel 330, an iron chelate of diethylenetriamine penta-acetic acid (10.5 percent metallic); Perma green iron 135, an iron chelate of sodium ferric hydroxy diaminopolyacetate (9 percent metallic); and Versen-ol iron chelate, a sodium iron chelate of N-hydroxyethylethylene diamine triacetic acid (9 percent metallic).

The sulfate forms of the trace elements and sodium borate were applied at the rate of 10 pounds per 1,000 square feet and the chelates at the rate of 1 pound per 1,000 square feet.

Sand was mixed with some of the fertilizer materials and Milorganite, a granular dried sewage, with others to obtain better coverage. Immediately after application the plots were sprinkled thoroughly. Notes were taken on the degree of greening over a period of 7 months.

Results and Discussion

Fertilizers containing premixed trace elements, though they cost slightly more, were found to be less effective than a major element fertilizer mixed with trace elements just prior to application.

Of the 77 combinations tested, a 1-2-1 fertilizer ratio mixed with iron and zinc compounds just prior to application gave the best and longest green-up. In most cases the green-up from the best combination lasted from 4 to 6 weeks in the summer and from 6 to 8 weeks in the winter. The same results were obtained whether the iron was derived from chelated compounds (Sequestrene or Chel 330) or ferrous sulfate (copperas), and the zinc derived from Sequestrene or zinc sulfate. The sulfate forms necessitated more frequent applications.

Good greening was obtained from the use of the iron materials, Sequestrene NAFe, Chel 330, or copperas, with the major elements. However, this greening was not as good as when zinc and iron were applied together. Perma green iron 135 and Versen-ol gave only a slight response. The addition of copper, manganese or boron to the major elements or fertilizing with just the trace elements showed no response.

Before the trace element combinations were tested, nitrogen fertilizers, those containing nitrogen and phosphorus and those containing nitrogen, phosphorus and potassium in varying ratios were tested to determine which major nutrients were needed. These preliminary tests indicated that a fertilizer containing all three of the major elements was necessary. A fertilizer containing potash gave a good response even though this alkaline soil tested more than 480 pounds of potash per acre.

The granular processed sewage sludge mixed with some of the fertilizers to obtain better coverage also was a beneficial organic addition. The major elements in the sludge were in a 6-4-0 ratio. Since sludge is not available commercially in the Winter Garden area, it cannot be recommended.

Acknowledgments

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