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# IRON CHLOROSIS



on

- Turf Grasses
- Ornamentals
- Vegetables

TEXAS A&M UNIVERSITY  
TEXAS AGRICULTURAL EXTENSION SERVICE  
J. E. Hutchison, Director, College Station, Texas

# IRON CHLOROSIS

## on Turf Grasses, Ornamentals and Vegetables

*C. D. Welch, Wendell Horne and Warren Anderson\**

Iron chlorosis is a condition which results when the green coloring matter in plants, chlorophyll, fails to develop or is destroyed. It normally appears first on young leaves. The leaves of chlorotic plants range from light green to yellow to almost white. Iron is necessary for the formation of chlorophyll. When iron is unavailable for plant use, chlorophyll fails to develop properly, and plants exhibit chlorosis. Iron chlorosis is most prevalent on members of the grass family (such as St. Augustinegrass, Johnsongrass and grain sorghum), certain fruit trees (citrus and peaches), many vegetables (particularly beans) and many flowers and ornamentals. Most soils on which iron chlorosis occurs contain iron, but in a form unavailable for plant use.

### **Where Chlorosis Is Found**

Chlorotic plants occur over all of Texas, but are more prevalent in areas with alkaline, calcareous soils. In Central, South and West Texas, it is a fairly common and serious problem. See map at right.

### **Other Types of Chlorosis**

Chlorosis or yellowing of plants can result from other causes. Certain other nutrient deficiencies may cause chlorosis. Poor soil aeration and nitrogen deficiency cause yellowing of plants, but the lower leaves are affected first. Virus diseases also may cause chlorotic symptoms, similar to iron deficiency. These disease symptoms are different, however, in that the leaf veins first become yellow rings on the leaf, with the whole leaf eventually turning yellow. Symptoms due to virus diseases may disappear, then recur.

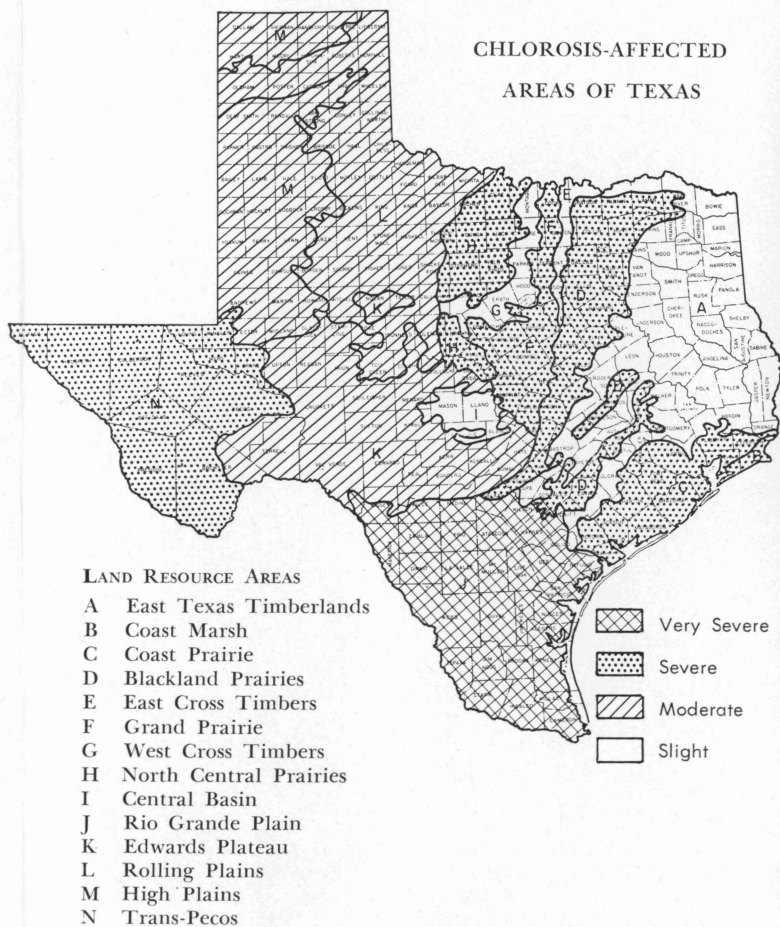
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\*Respectively, Extension soil chemist, Extension plant pathologist, and assistant professor, Department of Soil and Crop Sciences, Texas A&M University.

## Control

Iron chlorosis control calls for treatment of soil so that iron becomes available or addition of supplemental iron as a spray or soil application. Application of large amounts of well-rotted organic material on a regular basis tends to make the soils less alkaline and the iron more available. Well-decomposed compost, plus 1 pound powdered sulfur per 100 square feet, can be used to make the soil less alkaline. Acid peat also can be used.

To control chlorosis by addition of iron, use iron sulfate (copperas) or iron chelates according to instruction in Table 1. Its use should be restricted generally to spray application. If iron sulfate is applied to an alkaline calcareous soil, the iron may become unavailable in a relatively short time.



(Bottomlands not shown due to limitation of scale)

Table 1. Suggested Rates of Iron Chelate and Iron Sulfate

Plant	Iron chelate (dry) <sup>1</sup>		Iron Sulfate	
	Spray <sup>2</sup>	Soil application	Spray <sup>2</sup>	Soil application
Lawn and turf grasses	Dissolve ½ lb. in 10 gal. water per 1,000 sq. ft.	1 lb. per 1,000 sq. ft.	Dissolve 1 lb. in 10 gal. water per 1,000 sq. ft. (repeat)	5 lb. per 1,000 sq. ft. (repeat in 6 months if needed)
Ornamentals <sup>3</sup>	Dissolve ½ lb. in 10 gal. water and wet plants thoroughly.	1 oz. per plant	Dissolve 1 lb. in 10 gal. water. Wet plants thoroughly.	½ lb. per 100 sq. ft. (repeat if necessary)
Fruit trees	Dissolve 1 lb in 20 gal. water and wet leaves thoroughly.	1 oz. per diameter in. of tree	5 lb. per 100 gal. water. Wet leaves thoroughly.	5 oz. per diameter in. of tree.
Vegetables	Dissolve 1 lb. in 20 gal. water and wet plants thoroughly.	4 oz. per 1,000 sq. ft.	3 lb. per 20 gal. water and wet foliage thoroughly.	10 lbs. per 1,000 sq. ft. and mix with soil.

<sup>1</sup>These rates are based on chelates containing from 8 to 10 percent iron. If the product used is in solution or of a different concentration, adjust the suggested rates up or down to give comparable amounts of iron.

<sup>2</sup>One teaspoon per gallon will give approximately 1 pound per 100 gallons water.

<sup>3</sup>Ornamentals include trees, flowers and shrubs. Spray applications should be accompanied by soil applications of iron. These can be applied as a spray on the soil at the time plants are sprayed.





Iron chlorosis of St. Augustinegrass

Iron chelates are organic chemicals which can hold iron in an available form for plant use. A chelating compound acts in much the same way as a crab's claw encloses an object. Chelates can be mixed in the soil or applied as a spray. They remain available longer than iron sulfate and normally are needed in much smaller quantities than iron sulfate for soil applications.

Rates in Table 1 will vary with conditions and types of iron chelates. Check the container for iron concentration in the chelate to be used. If the chelate is in solution to be diluted, rates of application should be based on the final concentration.

### **Method of Application**

Before iron compounds are applied, be sure that the problem is caused by iron deficiency or chlorosis. Soil application of iron sulfate can be broadcast for lawn and turf grasses. For trees, iron sulfate is more effective if placed in holes punched with a crow bar or similar tool to a depth of about 2 feet. The holes should be even with the outer edge of the spread of the branches for trees or in the area of small feeder roots. The holes for shrubs should be 1 to 3 feet from the plants, depending on size. For flowers, band the iron sulfate 2 to 3 inches to the side, and 4 to 6 inches below the seed or young plant.

Iron chelates can be broadcast and worked into the soil for ornamentals, flowers and vegetables. They

can be applied broadcast for lawn, turf grasses and trees. Chelates should be watered in soon after application.

Spray applications of both sulfates and chelates should take place in late evening when the plant is actively growing. Late evening applications result in less evaporation, thus reducing the danger of burning. When preparing the spray solutions, add 1 teaspoon of soap detergent for each gallon of water for better coverage of foliage.

Spray applications of sulfates and chelates often are more effective and give quicker results than soil applications. However, the effect will normally not be as long-lasting and repeat applications may be necessary.