EFFECTIVENESS of the iron-sulfate, citric-acid, (plus detergent) spray in alleviating "lime induced" chlorosis in sorghum is shown in the photo above. The middle row (see arrow) in this field of chlorotic sorghum was sprayed by James R. Carter, assistant county agricultural agent in Maricopa county. The picture was taken 10 days after spray was applied.

On Sorghum

Spray Away Chlorosis

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A number of nutritional disturbances and diseases of crops cause a destruction and loss of green color in leaves — a loss of chlorophyll. Important among these is the so-called "lime induced" chlorosis that occurs on crops growing in soils that contain a high percentage of lime.

Since most of the irrigated soils in Arizona are highly calcareous, "lime induced" chlorosis occurs quite frequently on crops in this state. It is a nutritional disease that is usually caused by an iron deficiency. It may be a lack of available iron in the soil, or it may be caused by a condition in the plant under which the iron fails to perform its nutrient function.

Sorghum acreage in Arizona has increased from 59,000 acres in 1951 to 173,000 in 1955. With this increase, "lime induced" chlorosis has been observed in various degrees of severity. A mild chlorosis shows as yellow stripes on the leaves. These may continue to maturity, but have little effect on growth. In more severe cases there is a complete loss of chlorophyll in the leaves. The plants fail to form heads, or may be completely destroyed.

Can Be Cured

Experiments show that the chlorosis of sorghum can be cured, in many instances, by side-dressing the crop with an acidulated fertilizer containing iron sulfate, or by spraying the leaves with a solution of iron sulfate.

There are certain objections to the practice of side-dressing or any other method involving the application of iron salts to the soil. Iron salts do not remain in a water-soluble form, or even in an available form, long enough in calcareous soils. Another objection is based on the observations that a field of sorghum is rarely solidly chlorotic, but has scattered chlorotic and nonchlorotic areas. This irregularity may be due to variation in percentage of lime in the soil or to variable wetness of the soil.

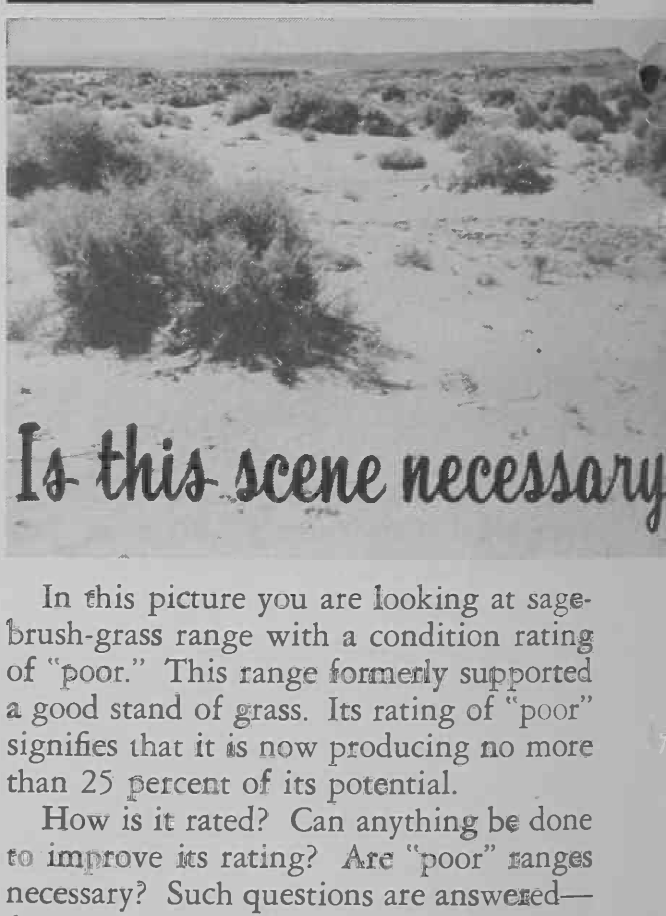
In general, application of iron salts to a highly calcareous soil is not recommended. Attention, therefore, has been given to the development of a spray.

Spraying chlorotic plants with an iron sulfate solution is a practice which has been in use for many years. For certain types of leaves it has been an effective cure for "lime induced" chlorosis. The major problem involved in the use of any spray is to make the spray stick on the leaf and to get an effective spread over the entire surface of the leaf. This is especially difficult for the grass type of leaf such as on the sorghum plant.

A spray solution was developed containing iron sulfate, citric acid, and a small amount of detergent to help spread the solution over the leaves. (See photo). The concentration of iron sulfate and citric acid in the spray solution varies somewhat depending on the kind of plant to be sprayed. For example, a 1 per cent solution may burn rose leaves but is entirely harmless for sorghum leaves.

An effective spray for sorghum should contain 4 to 8 pounds iron sulfate, 4 to 8 pounds citric acid, and just enough detergent to form a foam, per 100 gallons of water. Iron sulfate costs about 20 cents per pound and citric acid about 30 cents per pound.

The purpose of the citric acid is to retain the iron in a soluble form on the leaf. It also imparts a certain degree of stickiness because it dries to a syrupy consistency which spreads over the leaf surface with the help of the detergent present in the spray. In the U of A tests, chlorotic leaves sprayed with iron sulfate solution developed only scattered green spots on the leaves. When citric acid was mixed with the iron sulfate there was a good spread and the whole leaf turned green.



In this picture you are looking at sagebrush-grass range with a condition rating of "poor." This range formerly supported a good stand of grass. Its rating of "poor" signifies that it is now producing no more than 25 percent of its potential.

How is it rated? Can anything be done to improve its rating? Are "poor" ranges necessary? Such questions are answered—for northeastern Arizona—in the fourth bulletin of the series on Arizona range conditions. You may have a copy free by asking your County Agricultural Agent or by writing directly to the College of Agriculture, University of Arizona, Tucson.

Ask for Bulletin 266, Forage Production on Arizona Ranges, IV, Coconino, Navajo, and Apache Counties.