

"My Grain Sorghum Fields Were . . .

"YELLOW in the Middle"

"I've had it every year but I didn't know what to do about it."

This is the way Bob Montierth and Irwin John, both grain sorghum growers near Safford, describe their problem.

And they are not alone. Nor is the problem new. For the problem has the habit of cropping up here and there to nearly ruin a man's crop.

It shows up in Cochise county, along the Gila in Graham county, and in the Coolidge-Florence and Stan-

field areas in Pinal county.

W. R. Sikes near Stanfield told of his 200 acres of grain sorghum "that looked so bad I wouldn't have combined it . . . just disced it down."

And, what's more, Bob Dennis, extension agronomist, believes that when the symptoms are more generally known iron chlorosis may be recognized as a problem in other areas of the state.

He states that where iron chlorosis has been observed, and that is what this problem is called, the soil usually has been found to be calcareous. But, chlorosis of plants does not always occur on such soil.

Roy Rauschkolb, extension soils specialist, has been working with growers making soil tests and analyses. He feels that the iron deficiency problem is only the symptom and that the real answer is to be found in the soil involving several still unknown factors.

Bob Montierth observed that leaves of affected plants were at first yellow between the veins. In severe cases the entire leaf was yellow — almost white.

John Sears, agricultural agent in charge for Graham county, worked with Irwin John, Montierth and Dennis to set up a test plot near the highway.

They treated the yellowed sorghum with foliar applications of ferrous sulfate, a commercial grade of the product. They didn't treat all of the chlorotic plants but those in plots near the middle of the field.

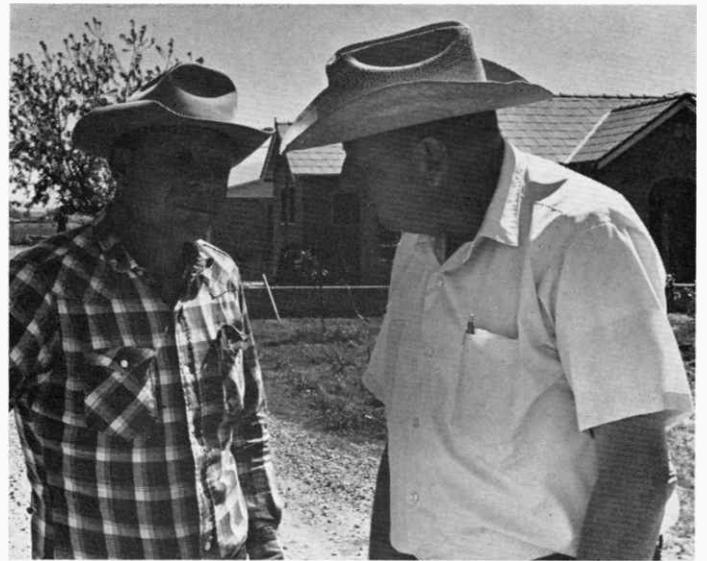
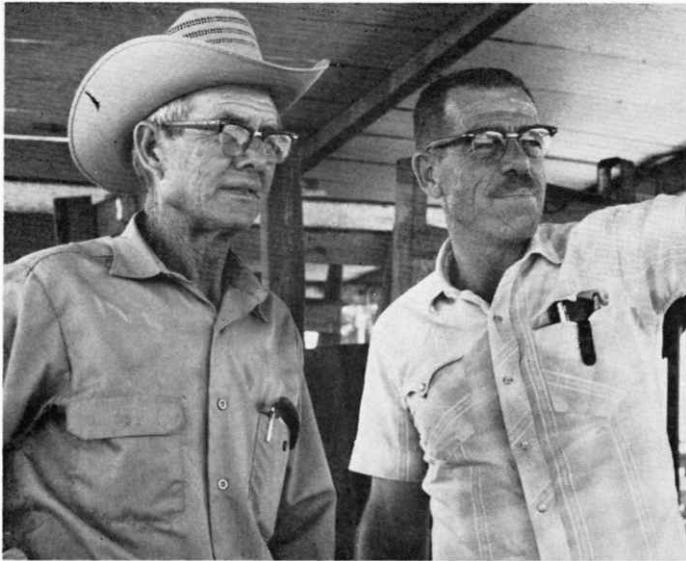
A few days after the treatment — five to be exact — the color contrast between the lush green of the treated strip and the sickening yellow of the untreated areas became apparent. Windshielding observers could easily see treated plants were responding to something.

And, those who saw stopped to ask. As Irwin John put it, "some of the growers after seeing this test strip went all the way in treating their entire fields."

On cover, Bob Montierth of Safford, left, discusses with John Sears, Graham County Agricultural Agent in Charge, the successes of treating grain sorghum with a solution of ferrous sulfate to leaves and stems of plants showing iron deficiency. Treated area is darker green in background while check, or untreated area, is yellowish.



Two plants at left are from the same field on the Irwin John farm near Safford. They show the difference between treated plant left and untreated plant on right. Also, in background near top of picture the darker green is of the treated area while background plants that are yellow are suffering from iron deficiency.



W. R. Sikes, left, grower near Stanfield, tells Jim Little, Pinal county agricultural agent that the next time he sees iron deficiency symptoms in grain sorghum he will apply ferrous sulfate immediately.

Irwin John, left, of Safford tells John Sears, Graham county agricultural agent in charge, "some of the other growers seeing the results this iron treatment brought went all the way in treating their crops."

referring to the control or untreated areas.

"The difference was like the difference of day and night," he said.

The untreated crop headed out eventually but failed to mature. From the treated area the yield was 5,000 pounds of grain per acre.

"I probably lost a ton per acre where I didn't treat the crop."

"It sure pays to do so," he added.

Montierth had a strip through a 35 acre field in which the plants grew to only about six inches in height.

"It was white!" he said.

He too applied ferrous sulfate and, "it looked great in just one week!"

Montierth left four rows of untreated crop for check from which he harvested at the rate of 1,000 pounds of grain per acre.

"Nothing," he said. But the treated area brought him two and a half tons per acre.

At Stanfield Sikes said, "I asked Jim Little (agricultural agent in Pinal county) to come out to see if he could suggest what to do about this crop."

"He sent soil and plant samples to the university for analysis but said he thought the problem might be iron chlorosis."

"We lost some time on this crop, but if I ever see these symptoms again I'll put iron sulfate on it right away," he said.

You can see the results immediately . . . in just a few days.

Sikes treated the entire 200 acres with two applications 10 days apart. His material cost was 70 cents per acre application.

None of these developments happen over night.

There's a history, sometimes long, of many people working together and separately to gain the knowledge needed for successful results which was experienced by Montierth, Irwin John and Sikes.

Researchers at the College of Agriculture in Arizona and in other states have worked with chlorosis for many years. And, their efforts have helped to show the way to achieve corrective treatment in the field.

In the early fifties county agents in Maricopa county field tested iron compounds on chlorotic plants.

During 1957 Jim Little used ferrous sulfate with citric acid in the Stewart area of his county. That particular formulation was very corrosive, and, as he put it, "ate up the tank."

"Citric acid," he said, "was very expensive, but the combination of chemicals rescued the crop." Now it is known that ferrous sulfate, alone, will do the job.

Carmy Page, agricultural agent in charge for Cochise county, worked on a chlorosis problem with growers in his area in 1959-'60. They tried iron chelates.

While the symptoms of iron deficiency nearly dissappeared with the application of a spray containing one pound per acre of iron chelate, there was very little difference in yield between treated and untreated areas.

In 1965 Little put out test plots at the Federal Prison Farm at Florence. The fact that these fields suffered a deficiency was as evident as those yellow centers in the fields of Bob

Montierth, Irwin John and W. R. Sikes.

So Little tested ferrous sulfate and several other chemicals. He found that iron sulfate was as, or more, effective than any other single or combination of treatments.

The test Sears and Dennis established on the Irwin John farm was a natural outgrowth of the earlier tests in Cochise, Pinal and other counties.

Dennis and Sears feel that iron deficiency symptoms result, at least in part, from the slow growth of roots at certain times of the year.

Application of a three per cent solution of a commercial grade of ferrous sulfate, to the leaves and stems of affected plants brings quick response. Correcting the deficiency gives the plant renewed vigor and helps to stimulate rapid root growth.

Then, as the plant's root system develops it usually is able to obtain sufficient amounts of iron from the soil for its needs. "And for the rest of the growing season the plant often does well by itself," Dennis says.

When symptoms return another treatment is suggested by Dennis. Treatments are most effective and least costly when done just as soon as symptoms are observed and when plants are only a few inches high.

Dennis estimates the average material cost for treatment of small plants with ferrous sulfate is 50 to 75 cents per acre.

You mix 25 pounds of a commercial grade of ferrous sulfate in 100 gallons of water to which you have added two quarts of a surfactant.

(Turn to back cover)

College Future

(from page 23)

We need many minor facilities which we may get, hopefully, over a period of years. A home management laboratory and a shops teaching laboratory have both been approved, but lost because of cuts in the capital appropriations.

Agricultural Extension Service is expected to continue as a function of the College of Agriculture. It is now and has been the most significant state-wide function of the University of Arizona. Coordinating Agriculture and Home Economics Extension with the teaching and research activities has kept it a part of the College of Agriculture where it should be now and in the future.

The development of General Extension other than the teaching of extension courses has caused many university administrators to question whether all Extension activities, including agricultural, should not be combined. Some universities have taken this step. I have taken the stand that agricultural extension should not be combined with general extension. Not one of my colleagues, where the combination exists, has expressed sympathy for the new plan.

Basically there are two principal reasons why I oppose the combination.

(1) New federal legislation creating extension activities in different areas are not restricted to Land Grant institutions, but become the function of several uni-

YELLOW in Middle

(From page 5)

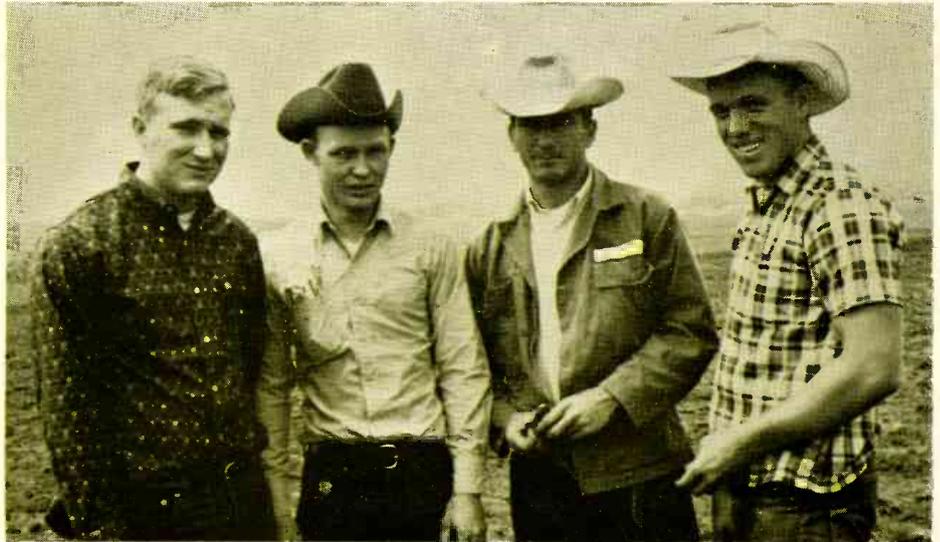
Spray this mixture on leaves and stems so as to wet them thoroughly.

"Without the surfactant the spray is less effective," Montierth will tell you from experience.

Some growers follow the recommendation of using an agitator to keep the iron sulfate mixed well in the solution while it is being applied. Montierth didn't. He felt the tractor bounced around enough going over the field that an agitator wasn't needed.

There are many problems yet to be checked by on-farm testing. These include studies of the best time to make an application and the value of repeat applications.

"But, it sure works," Montierth said. And, with the experiences that Irwin John and W. R. Sikes had they'll readily agree.



University of Arizona soils judging team in its first year of competition, won fourth place in national finals of intercollegiate soils judging at Kansas State University. Left to right are Chris Hayes, Tucson; Larry Humphrey, Florence; Ray Kingston, Tucson; and Dennis Fenn, Benson. Their coach is Dr. D. F. Post of UA College of Agriculture.

versities and colleges within a state. The state is then subdivided in such a way that each university or college has its little area of influence. Agriculture is unique in that it has a state-wide extension system which should be maintained.

(2) The chief advantage of the combination of Agricultural Extension with General Extension is to facilitate coordination of administration of all extension programs. The main advantage of keeping agricultural extension in the College of Agriculture, other than the reason noted in No. 1, is to coordinate subject matter. To me, the latter is more compelling than the former.

The future of the College of Agriculture and the School of Home Economics in the University of Arizona

is bright. Whether its future will live up to my, and hopefully your, expectations depends principally on the productivity of the faculty and the relationship of this productivity to the over-all objective of the College, i.e., to serve the agricultural interests of the state and nation. We have been supported by the University administration, the Board of Regents, the Legislature and the public because we have produced and because we have had a good public image. Whether the College continues to grow is largely in the hands of the faculty. If we continue to produce results useful in agriculture and if we maintain a good public image, our place in the University will be solid and we will be supported by the public which has benefited and hopefully will continue to benefit from our work.

PROGRESSIVE
AGRICULTURE
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Harold E. Myers Dean

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