Testing Lab, Professors Find Nationwide Sulfur Deficiencies

WHITE PLAINS, NY — Sulfur deficiencies are showing up in nearly every state in America. During the past several years, the number of states identified as sulfur deficient has more than tripled, from 13 to 43 states.

A critical component in protein and chlorophyll formation, sulfur is ranked as the fourth most important nutrient in plant growth, right behind nitrogen, phosphorous, and potassium.

To answer the call for more sulfur, approximately one in every three state colleges now includes sulfur in its fertilizer recommendations for a variety of field crops -- especially corn, small grains, and forages.

Extensive surveys conducted within the industry reveal that sulfur deficiencies are not linked to one specific area or soil type.

Bob Perry, general manager of Perry Agricultural Laboratory in Bowling Green, Mo., said sulfur deficiencies are cropping up in states across the country, and in a variety of soil types. Last year, the lab collected and tested about 52,000 soil samples from 38 states. Perry's results show that 66 percent of the samples analyzed for sulfur last spring were low.

Sulfur, like nitrogen, is essential for the formation of protein, vitamins, fats, oils, and chlorophyll within the plant, he explains. It also aids in the microbial digestion of crop residues, freeing up nitrogen and additional sulfur for use by emerging plants. "So crops treated with adequate amounts of sulfur will produce better yields," Perry stated.

Perry's findings are echoed by a nationwide survey conducted by Allied-Signal Inc., a fertilizer company based in Hopewell, Va. In the last five years, Allied has collected nearly 250,000 soil samples as part of its "Test for S" campaign. Results of the campaign show that 38 percent of the samples Allied analyzed ranked low in sulfur, and 43 percent ranked medium.

In the Corn Belt, 37 percent of the samples tested low for sulfur. In the Mid-South, 59 percent of the samples scored in the low category, and on the East Coast, 31 percent of the results analyzed turned up potential sulfur deficiencies.

Increasing concern about sulfur needs have led some scientists to raise their recommendations for sulfur application, especially on sandy soils.

University sulfur recommendations rise

Dr. Charles Mitchell, extension agronomist at Auburn University in Alabama, used to recommend that growers farming sandy soils apply 10 pounds of sulfur per acre for row crops. Now he recommends that they apply 20 pounds per acre.

"The sandy soils on our Coastal Plain, from Virginia to Louisiana and into parts of Texas, leach sulfur beyond the reach of shallow-rooted crops," Mitchell explained. "A wet winter will leach out sulfur that is either provided by organic decomposition or applied in the fall.

Heavier soils are not immune from sulfur deficiencies, either. At the University of Minnesota, extension specialist Dr. George Rehm has found that some heavier soils with less than two percent organic matter also produce higher yields when treated with sulfur.

"We are increasing corn yields by 20 or 30 bushels per acre by applying sulfur to sandy soils," Rehm notes. "And results with alfalfa on these same sandy soils are even more dramatic -- we've doubled our yields."

S no longer incidential

The mounting interest in sulfur fertilizer comes as no surprise. Don Messick, agronomist for Allied-Signal, explains that there are three major reasons for the recent trend of falling sulfur levels in the soil. First, modern, high-analysis N-P—K fertilizers contain little or no sulfur. Years ago, many dealers used materials that already contained sulfur, like ordinary superphosphate (0-20-0-12S). Also, more intensive land use has strained the soil's sulfur reserves as double-cropping and high-yield production become more common. Last, the push for maximum economic yield has led many growers to rely on the soil's shrinking sulfur reserve without supplementing it.

Environmental sulfur, a product of industrial waste and once an important source of sulfur in the soil, is also on the decline. At the University of Illinois, Dr. Robert Hoeft predicts that pollution control measures will continue to decrease the amount of sulfur carried to crops through the air.

"With the stricter air quality standards and more scrubbers in the smokestacks, we're going to see a lot less sulfur replenished from environmental sources," he said.

Power plants and industrial centers west of the Missouri River give off relatively little sulfur because of their use of clean-burning coal, according to Hoeft. Farms in these areas show a far higher incidence of sulfur deficiency than those in areas with more pollution.

"Without atmospheric sulfur to help replenish the supply that we use in high-yield production, it's getting more important to apply a sulfur fertilizer," he noted.

Ammonium sulfate is readily available

There are many forms of sulfur on the marketplace, but only sulfur in the sulfate form is immediately available to the plant. Dr. Mitchell explains that this is crucial for plant uptake and yield determination.

"In the early life of the plant, there is a period after dormancy when yield is determined and sulfur is taken up," he says. "The soil conditions during that period are often too cold -- and too short on microbial activity -- to convert other sources of sulfur to the sulfate form fast enough for the plants to use it.

"That's why sulfate is the best source of sulfur to apply. Ammonium sulfate (21-0-0-24S), which supplies nitrogen as well as sulfur, is an excellent choice," Mitchell recommends.

Perry expects to see fairly high sulfur levels in next spring's soil samples because the weak '88 crops didn't take up much of the nutrient. He warned farmers not to be misled by these healthy readings into assuming that their fields are necessarily well-stocked with sulfur.

"The '89 tests should prove and explain the old rule of thumb about getting a good crop after a drought-stricken one," he explained. "All of the nutrients that weren't taken up last year will help next year's crop to some degree. But if a farmer achieves his yield goals in 1989, he'll probably end up right back at the deficient level. So he's got to be ready to apply sulfur regularly if he wants his productivity to be consistent.

"Everybody is cost-conscious in today's market," Perry said, "and some people believe that cutting back on inputs will save them money. But -- now, more than ever -- ignoring sulfur deficiency can cost you money by dragging down your yields. It's very important to keep an eye on the sulfur content of your crops and soils, no matter what part of the country or what kind of soils you farm.

"We have the ability to monitor the soil and its nutrients," he added. "We don't have to wait for Mother Nature to send us a drought to rebuild our fertility. Instead, we've got to continue watching what's going on in our soil, and we've got to do something about it by replenishing the nutrient reserves in our soil. Then we're on the road to profitable farming."

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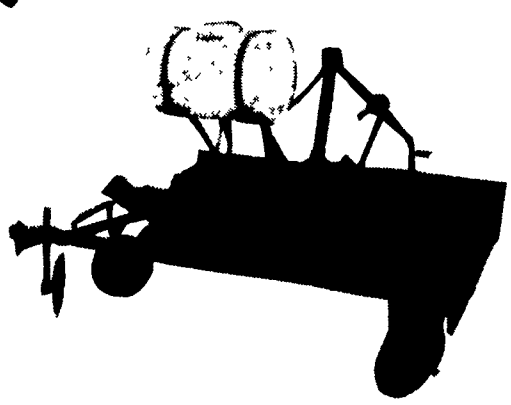

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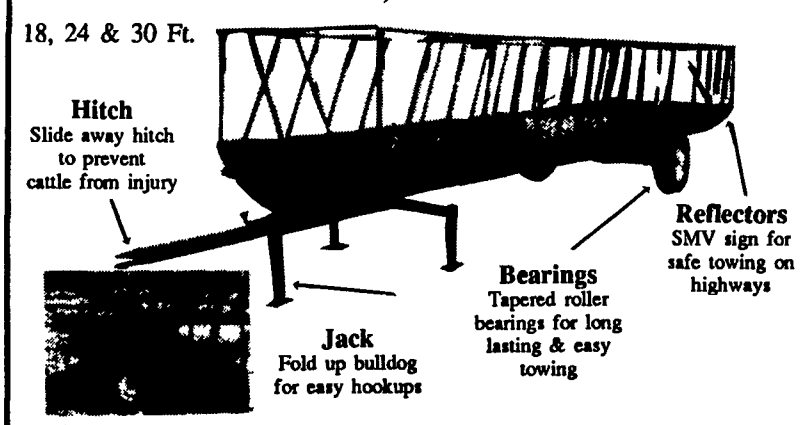

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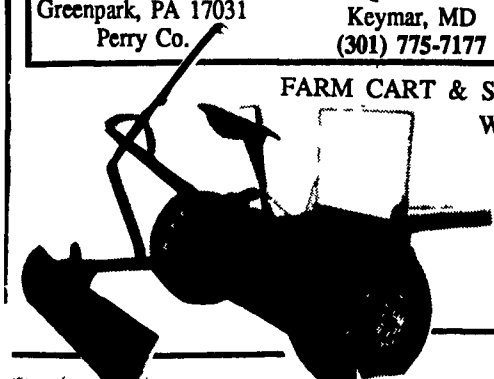

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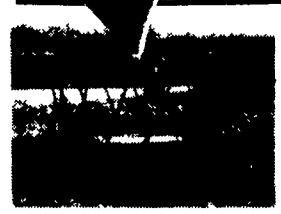

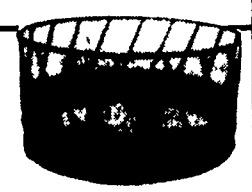

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