Sharp Eye and Tissue Testing Program Save Wheat Crop

It was not hard for Georgia Love, Regional Agronomist for the North Carolina Department of Agriculture and Consumer Services (NCDA&CS) in Rowland, NC, to identify a Robeson County farmer's sulfur deficiency in March. The 40-acre wheat field was streaked with yellow, stunted plants in early spring – a classic symptom of sulfur deficiency in a crop and region known for the problem.

The dark streaks, said Love, indicated the presence of subsoil slits from a field operation that let roots down to tap deeper reserves of sulfur. Shallower-rooted wheat plants were stuck in sulfur-deficient topsoil, and they were suffering.

Deficient Crop

In this North Carolina wheat field, the yellow, stunted plants were a clear indication of sulfur deficiency.

After Application

Applying ammonium sulfate with plant-available sulfate-S allowed the wheat to rebound in weeks.

Photos courtesy Georgia Love, NCDA&CS

Faced with a worried farmer, a concerned crop advisor and a crop in trouble, Love took the following actions.

- She took tissue samples and sent them to NCDA&CS's laboratory for analysis. Not surprisingly, the samples showed up low in sulfur – and the nitrogen-to-sulfur (N:S) ratio was an excessive 50:1. Love explained that ratios above 18:1 call for the addition of sulfur fertilizer to provide enough S for the plant to properly utilize the N it takes up.

- She prescribed a topdress application of ammonium sulfate (AS), which delivers sulfur in the plant-available sulfate-S form for immediate results. “Within about a week, you can normally start seeing the wheat turning around, and within two to three weeks, it’s completely changed,” Love said.

- Love also recommended applying ammonium sulfate in the fall when establishing subsequent wheat crops. “I like to see 20 to 30 pounds of sulfur up front,” she stated. “That way, you don’t get into the middle of the season and a deficiency starts to appear.

Following the application of 300 pounds of ammonium sulfate per acre at the beginning of stem elongation (GS30), Love reported that the troubled wheat rebounded, yielding 50 to 60 bushels per acre.

Kristin Hicks, Chief of NCDA&CS Agronomic Services’ Plant, Waste and Solution Media section, said the lab’s two-day turnaround time on plant tissue analysis samples allows growers time to react to deficiencies of mobile nutrients, including sulfur.

Hicks said sulfur deficiencies are increasingly common:

- “Sulfur deficiency is something we see more of than we used to,” she noted. “It’s somewhat ironic that by preventing pollution through the Clean Air Act, we’re creating sulfur deficiencies because we get less deposition from the air.”

- “The value of tissue testing is it’s telling you what the plant is actually getting, rather than what’s in the soil,” Hicks pointed out. “Typically, farmers are doing soil testing in the fall. Come spring, if we’ve had a really wet winter, they won’t really know if all the fertilizer they put down in the fall based on their soil test is still there.”

- “Fortunately, because sulfur in the sulfate form is very soluble, sulfur deficiency is one of those deficiencies you can correct more easily than others,” she said, adding that it makes tissue testing especially useful for managing sulfur, nitrogen, potassium and boron.

The key, according to Hicks, is to use field scouting and tissue testing to watch crops for symptoms of nutrient deficiencies, as well as for imbalances.

“Corn and wheat are crops where you really have to watch the N:S ratio,” Hicks cautioned. “If the ratio is out of balance, you can see sulfur deficiency symptoms even if the N and S levels are not deficient.”

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