

Sulfur deficiency symptoms in wheat

[Ag Professional](#)

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During this past week, we have found fields of pale yellow wheat in parts of south central and north central Kansas. The cause is sulfur (S) deficiency.

Sulfur deficiency symptoms in wheat can be similar to nitrogen deficiency, with a general chlorosis of the leaf. However, S deficiency does differ from nitrogen (N) deficiency in that the whole plant is pale, with a greater degree of chlorosis in the young leaves. Sulfur is not mobile in the plant like N, so lower leaves do not show more severe deficiency symptoms than the upper leaves unlike N.

The uniform nature of the yellowing on the plants is one means of diagnosing sulfur deficiency in wheat. Another common difference compared to N deficiency is the pattern in the fields. Sulfur deficiency often occurs first on slopes, eroded areas, on coarser soils, or wherever organic matter levels are lowest. Therefore, deficiencies are usually limited to only certain areas of the field.

Plant available S is primarily derived from soil organic matter release. Warm moist soils promote mineralization, so S deficiencies are more likely to occur when soils are cold in the spring. But S deficiencies can also be evident during the remainder of the growing season, particularly in soils prone to S deficiency. During the period of residue buildup in no-tillage, S mineralization may also be limited. Sulfate (the plant available form of S) is highly mobile in the soil, leaching below the root zone with excess rainfall. Soil testing at the 0-6 inch depth for sulfate-S has not been considered reliable because of this mobility. Profile sampling (0-24 inches) would provide a better estimate of sulfate levels in the soil.

Including S in a fertilizer program to avoid S deficiency is more efficient and less costly than correcting an S deficiency once it occurs. Typically soil applications of 15-40 pounds of sulfate-S per acre are sufficient to prevent S deficiency. Adding ammonium thiosulfate (12-0-0-26 S) to UAN solutions or blending ammonium sulfate (21-0-0-24 S) with urea are convenient and cost-effective ways to provide S. Other sources include elemental sulfur; however this source is not available to the crop immediately and should be applied in time to allow conversion to sulfate-S. Calcium sulfate (gypsum) can also be an economical and effective fertilizer option.