We know that wheat responds to nitrogen and phosphorus applications, but have you ever wondered if wheat responds to chloride (Cl) applications?

Since 1990, there have been 44 field trials across the state regarding chloride applications on wheat with varying results. Generally, these studies compared Cl fertilizer rates of 0, 10, 20, 30 pounds per acre and Cl sources, potassium chloride (KCl) and magnesium chloride ($MgCl_2$) that were topdressed in late winter. Also, there were several studies that compared the Cl responses of different wheat varieties.

Of the 44 studies, there was a significant yield increase to applied Cl in 25 of the trials. The average yield increase was 5.7 bushels per acre over the check or 0 Cl treatment and the general range of yield increases was between 5 and 15 percent. In 11 of the 44 studies there were no statistically significant differences in yield, but there was a positive trend in yield. The average of those 11 studies was a modest 1.7 bushels per acre increase over the check treatment. And there were 8 trials in which there were no significant yield differences, but the yield trend was equal or slightly negative compared to the check treatment. In those studies there was an average 0.6 bushels per acre decrease in yield.

Of the 25 studies that showed a yield increase to Cl applications, there was only 1 study in which there was a significant yield difference among the Cl rates. In that lone study, the wheat yield for the 10 pounds per acre rate was greater than the higher rates. Otherwise, there were virtually no yield differences between the 10 pounds per acre and the higher rates. However, all chloride applications increased leaf tissue Cl levels compared to the check treatment. Also, there were no differences between the Cl sources.

Of the 25 studies that showed a yield increase to Cl applications, all but one study had soil Cl test levels below 40 pounds per acre (<6 ppm) in the 24-inch profile and 18 of those studies had soil Cl test levels below 20 pounds per acre (<3 ppm) in the 24-inch profile.

What's the bottom line?
Chloride is a plant nutrient that is often overlooked. A soil Cl test should be taken from a 24-inch profile to determine Cl levels. A yield response can be expected on soils testing below 40 pounds Cl per acre (<6 ppm), but especially on soils below 20 pounds Cl per acre (<3 ppm). The current Cl fertilizer recommendation is for 10-20 pounds per acre to be applied preplant or topdressed in late winter on low Cl testing soils (<3-6 ppm). Chloride is chloride, thus there is no difference among Cl sources.

For more details about this research see:
Kansas Fertilizer Research-1990-2000, and 2002. Report of Progress 618, 647, 670, 697, 719, 749, 778, 800, 829, 847, 868, and 903. K-State Research and Extension.

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