

Post Rock Extension District Column

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K-State Research and Extension-Post Rock District

Crop Production Agent

Have you thought about adding chloride to your fertility management program?

Wow, winter is definitely still here with the sub-zero temperatures we have experienced, but the warmer temperatures have been comforting. Spring will be here before we know it and actually it isn't too far away! It soon will be time when you will be in the field planting corn, soybeans and grain sorghum. So it isn't too early to start thinking about your fertility program.

Of course your first step with any cropping system is soil testing. This component is critical and is the cornerstone of your fertility program. This will help provide you with the needed analysis of your soil to determine the nutrients that need to be applied depending on your crop choice. K-State Research and Extension does offer this service through the Soil Testing Laboratory, but there are also several soil commercial laboratories in the state of Kansas that are also available to producers. So we highly encourage you to include soil testing as part of your fertility management program.

“Chloride is one of the essential micro-nutrients that you may have not thought about to include in your fertility program,” according to Dr. Dorivar Ruiz Diaz, K-State Research and Extension Soil Fertility specialist. It is normally present in the soil in sizeable quantities, however, evaluations in Kansas indicates fairly low soil chloride levels. A critical role of chloride is in the oxidation of water in photosynthesis and as an activator of several enzymes. In addition, chloride application has been shown to suppress or reduce the effects of numerous diseases on a variety of crops.

Ruiz Diaz points out that physical symptoms of chloride deficiency in plants vary and are not always consistent. In wheat, some varieties show a characteristic leaf spotting, best described as random chlorotic spots on the leaves. The spots resemble tan spot lesions, but are smaller and do not have the characteristic “halo” at the edge of the spot. On low-chloride soils in Kansas, some varieties consistently show the leaf spotting, while other varieties never spot. Other research indicates no obvious visual deficiency symptoms which occurred on corn or grain sorghum, even where chloride fertilization increased yields.

Summaries of soil test data in Kansas show a majority of the samples had chloride levels below 40 pounds per acre, with a significant number of samples less than 10 pounds per acre (on 0- to 24-inch samples).

As an anion, a negatively charged ion, chloride is not readily adsorbed on the soils exchange complex and is subsequently not attached. Because of this, chloride moves readily with soil water. Chloride is quite leachable, even more so than nitrate.

Kansas State University Soil Testing Laboratory and most commercial labs offer a chloride soil test. Ruiz Diaz emphasizes that because of the leaching potential of chloride, it is recommended to sample to a depth of 24 inches to best assess soil chloride status (just like nitrogen and sulfur). When testing for pH, phosphorus (P), potassium (K), organic matter, and zinc, a 0- to 6-inch sample is recommended. When testing for the mobile nutrients (nitrogen, sulfur, or chloride) a 0- to 24- inch sample is highly recommended.

Ruiz Diaz points out that potassium chloride (KCl) is the most common and readily available chloride-containing fertilizer in Kansas. On an elemental basis, KCl fertilizer is 53 percent potassium and 47 percent chloride. For ease of calculating, assume a ratio of roughly 50 to 50 potassium to chloride. For example, if 50 pounds of KCl fertilizer is applied, about 25 pounds of chloride would be furnished. Since P and K in fertilizer are reported on an oxide basis (P₂O₅ and K₂O), it can be confusing because many fertilizer dealers know potassium chloride as 0-0-60 or 0-0-62. For ease of calculating chloride application, just remember the product is about 50 percent chloride. Research in Kansas has evaluated all sources of chloride and results show each of these fertilizers to be equally effective in supplying chloride.

Research indicates the likelihood of a response to chloride fertilizer is directly related to soil chloride levels. So to start incorporating chloride fertilization, a soil test is highly recommended to determine if a chloride application might benefit your crop. When soil tests indicate a need for chloride, the recommendation is to apply 10 to 20 pounds of actual chloride per acre, depending on soil test chloride level.

Considerable research with chloride fertilization has been conducted in Kansas on wheat, corn, and grain sorghum. Positive yield responses have been noted on these crops. To date, response to chloride fertilization on other crops such as soybean has been limited. Remember, response at any given soil chloride level in a specific year may vary with several factors, including variety, disease pressure, timing of moisture or temperature stress relative to the effect of chloride on plant development, and soil chloride distribution relative to crop root distribution.

A more detailed research summary, with yield response data, can be found in the recently updated KSRE publication MF2570, "Chloride in Kansas: Plant, Soil, and Fertilizer Considerations": <https://www.bookstore.ksre.ksu.edu/pubs/MF2570.pdf>

The Post Rock Extension District along with several other NW Extension counties and districts are hosting an ONLINE webinar series, "Crop Talk" every Tuesday and some Wednesdays through March 9. These are held at 10:30 a.m. for about an hour depending on the questions from participants. The "Crop Talk series" started on February 2, but if you were unable to participate, the handouts and recordings are posted on our Post Rock Extension District website on the "Crop" page then go to "Online webinar series". To register simply go to our Post Rock Extension District website at www.postrock.ksu.edu under "upcoming events" on the main page. Once you register, a link will be emailed to you to join us. Hope you will be able to join us!

Post Rock Extension District of K-State Research and Extension serves Jewell, Lincoln, Mitchell, Osborne, and Smith counties. Sandra may be contacted at swick@ksu.edu or by calling Smith Center, 282-6823, Beloit 738-3597, Lincoln 524-4432, Mankato 378-3174, or Osborne 346-2521. Join us on Facebook at "Post Rock Extension" along with our blog site at postrockextension.blogspot.com. Also remember our website is www.postrock.ksu.edu and my twitter account is @PRDcrops.