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From Scientific Staff of the
International Plant Nutrition Institute (IPNI)
3500 Parkway Lane, Suite 550
Norcross, Georgia 30092-2806 USA

Phone: 770-447-0335 Fax: 770-448-0439
E-mail: info@ipni.net Website: www.ipni.net

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CONSIDERING CHLORIDE FOR WHEAT

Chloride (Cl^-) has been formally recognized as a plant nutrient since the 1950s. It is classified as a micronutrient, but plants may take-up as much Cl^- as secondary elements such as S. Concentrations of Cl^- in wheat flagleaf and corn earleaf at flowering are commonly in the range of 0.25 to 1%.

Chloride is involved in several important roles in plants, including,

- Photosynthesis and enzyme activation
- Transport of other nutrients in the plant
- Stomatal activity
- Accelerated plant development
- Reduced lodging

Chloride is an anion and is therefore mobile in the soil. It can be leached from the soil profile where internal soil drainage is good. Chloride may be supplied to soils from several external sources, including fertilizer input, atmospheric deposition, and irrigation water. Thus, low soil Cl^- level is favored where: 1) there is limited application of Cl^--bearing fertilizer such as muriate of potash (KCl); 2) where there is low atmospheric Cl^- deposition (deposition is highest in coastal regions and decreases inland), and 3) in non-irrigated conditions. These conditions are met across much of the Great Plains.

Response of wheat to Cl^- fertilization has been observed throughout the Great Plains from Texas to Canada. Much has been reported over the past 20 years or so on work from this region. A recent update and summary of Cl^- work in Kansas was published in a 2009 *Better Crops* magazine article (Vol. 93, No. 4). It is generally accepted that there is little difference in performance among Cl^- sources on winter wheat, and that topdress and preplant applications are effective. However, where there is potential for leaching, topdress application in the spring may be advantageous.

Increases in wheat yield from Cl^- fertilization are usually due to either a classical nutrient response and/or suppression of fungal diseases. Under low soil Cl^- conditions, some varieties may exhibit Cl^- deficiency symptoms, sometimes referred to as physiological leaf spot syndrome. These symptoms are similar in appearance to tanspot or septoria, but are not caused by a pathogen. The absence of leaf spotting does not always mean that Cl^- is not deficient since spotting is dependent upon wheat variety. Chloride has been shown to reduce the severity of several root and foliar diseases. In one Texas study, leaf rust infection of the flag leaf was reduced from 68 to 27% by topdressing with 40 lb Cl^-/A as muriate of potash.

Whether or not wheat will respond to Cl^- usually depends upon soil Cl^- level, disease pressure, plant Cl^-, and variety. Response to Cl^- is likely when soil Cl^- levels are less than 45 lb/A from 2-ft. deep soil samples. Kansas State University recommends 10 lb Cl^-/A application when the soil level is 30 to 45 lb/A, and 20 lb application when soil level is below 30 lb/A. It has been shown that some varieties are much more responsive to Cl^- than others.

Chloride response in wheat can ultimately be expressed in terms of increased yield, higher test weights, and greater kernel plumpness. Therefore, it is worth considering the need for Cl^- on the upcoming wheat crop.

— WMS—

For more information, contact Dr. W.M. (Mike) Stewart, Southern and Central Great Plains Director, IPNI, 2423 Rogers Key, San Antonio, TX 78258. Phone: (210) 764-1588. E-mail: mstewart@ipni.net.

Abbreviations: S = sulfur.