













### Excess Micronutrients

There are circumstances that can result in an excess of a particular micronutrient. This can lead to a toxic condition that may reduce soybean performance. A case in point is chlorine.

Research studies have been conducted to explore the potential soybean yield reduction that might result from excessive Cl in the soil. This condition can occur where large amounts of potassium fertilizer in the form of potassium chloride (KCl) have been applied to address soil K deficiency.

- Potassium chloride is the cheapest source of fertilizer K. However, high soil Cl concentrations can result when high rates of KCl are applied.
- Research has shown that the amount of KCl applied ahead of a soybean crop should be limited to no more than about 100 lb/acre. However, this can vary from field to field.
- If soil test K is very low, higher rates should be considered since the yield reduction due to insufficient K is greater than yield reductions that might result from higher rates of KCl.
- When chloride toxicity is a concern, consider applying potassium sulfate as the K fertilizer.
- The effect of too much Cl will be worse on poorly drained soils in years with low rainfall since Cl will not move out of the root zone.
- Two important points should be considered when managing this issue. 1) Apply K fertilizer only where it is needed. 2) Apply K fertilizer annually when needed so the rate that is applied will be relatively low each year.

### TISSUE SAMPLING/TESTING

Tissue testing is a tool that can be used to assist in identifying nutrient deficiencies in soybean plants that may be limiting crop growth and yield in the field. The nutrients in the plant at a given time as measured by tissue analysis reflect what the plant has been able to obtain from the soil vs. what nutrients are available in the soil reservoir. The nutrient concentration of a particular plant tissue can be compared to a known critical nutrient concentration to determine if sufficient nutrients are present in the plant to achieve optimum performance and/or yield.

Results from tissue testing cannot be used to correct nutrient deficiencies during the current growing season, but rather can be used in planning for future nutrient applications, or to validate the current fertility program for a specific crop. Thus, tissue testing for nutrient sufficiency or deficiency

should be used in conjunction with soil tests.

Click [here](#) to access a White Paper on this website that provides information about tissue testing, plus guidelines for using this tool to assess the nutrient status of soybean.

### GENERAL INFORMATION

Click [here](#) for a Univ. of Missouri article that gives details for diagnosing nutrient deficiencies in plants. Click [here](#) for an MSU Extension publication titled “Soil Fertility and Fertilizers” that covers most subjects pertaining to soil fertility and fertilizers. An Iowa State Univ. publication titled “[Soybean Nutrient Needs](#)” is a good source for information specifically about soybean.

Slaton, Roberts, and Ross of the Univ. of Ark. published “[Fertilization and Liming Practices](#)” (Chapter 5—updated in 2013) in the Arkansas Soybean Production Handbook. The contents of this chapter include a review of soil test-based fertilizer recommendations for soybean production sites, a description of the symptoms of nutrient deficiencies or toxicities in soybean, and research- and/or experience-based insights pertaining to nutrient management strategies for the crop. This is probably the most thorough treatment of the subject matter of this White Paper.

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