



## Developing a Cotton Special

Fertility management in cotton can be overwhelming. Cultural practice limitations and challenging climate conditions can leave a grower feeling helpless about when and how to apply fertility. In addition, it is vital in cotton to manage vegetative and reproductive growth in a perfect balance within the plant to maximize boll load and fill. As a perennial tree under native environmental conditions, cotton plants want to set fruit throughout their growth cycle. A successful cotton fertility program maintains adequate levels of nutrition throughout the season without allowing the crop to take advantage of excesses in the soil or become deficient. It is critical to economically manage the cotton plant's nutrient needs to maximize yield and quality.

A current soil test analysis is the first step in developing a crop nutrition plan. Unless a grower knows the condition of their soil, any fertilizer program will be based on averages and generalities. Significant nutrient deficiencies cannot be adequately addressed without soil test information. In today's economic environment, it is vital to understand what the soil has, and what it doesn't have, in order to make a well-thought-out fertilizer program. After that, knowing what nutrients are critical to cotton growth is the second step.

### **Nitrogen (N)**

Cotton's optimum range for nitrogen use is narrow, with penalties on both sides. Too little limits plant health and yields; too much and end-of-season vegetation creates problems. While nitrogen is used by the cotton plant more than any other nutrient, it is important to ensure it is available throughout the growing season, rather than fully available immediately after a fertilizer application. Excessive nitrogen in cotton can lead to rapid vegetative growth with less energy being utilized for seed and lint production.

### **Phosphorus (P)**

Phosphorus is key for early root development and early season vigor. As a tap-rooted crop, cotton needs all the help it can get to develop a robust root system capable of capturing nutrients and water. Phosphorus also promotes the movement of growth substances in the plant, such as sulfate into leaf chloroplasts. Cotton often does not demonstrate a visible phosphorus deficiency – or symptoms may not be as clearly defined as with other nutrient deficiencies. Regardless of how in-season nutrient deficiencies are exhibited, the consequence is always yield loss.

### **Potassium (K)**

During reproductive stages, cotton hungers for K. Potassium is key to maintaining overall plant health, water-use efficiency, and adequately retaining and filling bolls late in the season. In fact, the need for K increases dramatically when bolls are set. Potassium is also critical in fiber elongation, making potassium critical for quantity and quality of fibers.



### **Secondary Nutrients**

While often overlooked, the secondary nutrients are essential to rounding out a cotton crop's fertilizer program. Cotton can take up as much magnesium (Mg) and sulfur (S) as it does phosphorus. In fact, it takes more calcium (C) than P. Calcium helps strengthen cell walls, which enhances cell division and plant growth. It can help prevent seedling disease and poor stalk strength. Magnesium is needed for production of chlorophyll. Sulfur is essential in the production of three amino acids, which are the building blocks of proteins.

### **Micronutrients**

It's true that these nutrients are generally needed in very small amounts, but deficiencies in one or more of these nutrients will negatively impact the same metabolic processes as the primary nutrients. High or low levels of other nutrients can affect the availability of micronutrients.

### **Soil pH**

Cotton likes a soil with a pH between 5.8-8.0. When soil pH is above 8.5, or below 5.5, yields can be impacted dramatically. Soil pH can also impact nutrient availability, and should be managed carefully through soil amendments.

### **Conclusion**

While properly collecting and submitting soil samples is a critical first step, interpreting the results is another challenge. There is a lot of information on a soil test analysis report.