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THE INFLUENCE OF POTASSIUM ON COTTON QUALITY

Is there any profit for cotton growers with today's low prices? Cotton specialists believe so. They are advising that a high yield of quality cotton is the best approach since growers have only limited control over the market price. They suggest this search for yield improvement might begin with an in-depth review of each and every production practice. In some cases, added yield and/or quality can be found with better timing of practices or a better fit of one practice with another. An example is improved disease resistance from a better balance of nutrient inputs. In fact, most management practices work best in a team effort that contributes to improved yield and quality. In this regard, potassium nutrition seems to be especially important for cotton.

Potassium's effect on cotton growth is not as visible as with nitrogen. It performs many of its jobs in a more "behind the scenes" manner. Its functions have led cotton specialists to describe potassium as the "quality element". In fact, Auburn University scientists have long recognized the key roles potassium performs in cotton production. They report that the relative yield of cotton is only about 45 percent in the absence of potassium fertilization on low potassium soils.

The benefits associated with providing adequate potassium are several and often vary from one field to another. They relate to better crop quality, improved disease resistance, greater stress tolerance, and more effective use of other inputs such as nitrogen. These cotton responses can be very site-specific and may vary from year to year.

During the 1999 cropping season, Alabama researchers measured cotton yield responses to 60 pounds of K₂O applied to a sandy coastal plain soil. When planted in ultra narrow rows, the response was 345 pounds of lint per acre. When planted in 36-inch rows, response was measured at 262 pounds. This represents a substantial return from an investment in potash costing about 10 dollars per acre. The effect of potassium on lint quality is being measured at this time.

Why is cotton so responsive to applied potassium? Researchers believe it can be due to any one or more of the following research findings. It is well documented that plants will often "cut out" early due to a shortage of potassium. In other studies, inadequate potassium resulted in more leaf disease problems, premature defoliation, and even less resistance to wilt and nematode injury. Georgia cotton specialists reported that a low plant potassium level was responsible for most cases of *Stemphylium* leafspot reported during the past two seasons.

Cotton fiber quality is evaluated in terms of length, strength and fineness of the fiber as well as its color and cleanliness. Research studies show that potassium contributes not only to cotton boll size, but it also improves micronaire, strength and length of cotton fibers. potassium-deficient fiber also has a high content of naps. Cloth woven from potassium deficient cotton fiber results in an inferior grade of cloth due to unsatisfactory color dyeing resulting from the nappiness of the fiber.

To harvest these yield and quality benefits, potassium must be readily available in adequate amounts and at the appropriate growth stage. Peak demand begins nearly 60 days after planting with pin head square and continues through late season boll fill. Specialists recommend highly fertile soils, split applications of potassium on sandy soils, and late season foliar fertilization for certain high yield fields to maintain a high rate of photosynthesis. A balanced nutrition program allows potassium to contribute its best toward highest crop yield, quality and profitability.

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Note: *Agri-Briefs* are available online at the PPI web site: ppi-far.org/agri-briefs