DOES COTTON SEED SIZE INFLUENCE THE RISK OF INJURY FROM SOIL-APPLIED HERBICIDES?

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Abstract

Pre-emergence (PRE) herbicides, once a primary component of weed control in cotton, are reestablishing utility as glyphosate-resistant weeds become more prominent in the Mid-South. Although considerably effective, inconsistent injury is often associated with the use of soil-applied herbicides. Agronomic and environmental factors that could potentially affect the tolerance of cotton to PRE-applied herbicides were evaluated to better understand the causes of injury and steps growers could take to minimize the risk of injury from soil-applied herbicides. A field experiment was conducted in 2012 and 2013 to evaluate the influence of seed size on cotton tolerance to various rates of PRE-applied herbicides.

The experiment was conducted in Fayetteville, AR in 2012 and 2013 and organized as a 5 X 3 factorial. Five seed sizes ranging from 9.3 to 13.1 g /100 seed and three herbicide applications (untreated check, 1 and 2 lb/A of diuron) served as experimental factors. Assessments for injury were taken at 1, 2, 3, and 4 weeks after treatment (WAT). At 4 WAT, plant counts per 2 m of row were conducted and biomass was harvested. Data was subjected to ANOVA and means were separated using Fisher's Protected LSD at $\alpha = 0.05$. Results suggest that a strong relationship between seed size and injury exists. Smaller seed size led to increased risk of injury from diuron applied PRE and a trend for greater cotton biomass increased with larger seed sizes, suggesting greater tolerance to PRE herbicides as seed size increases.