THE EFFECTS OF RESIDUAL HERBICIDE INJURY AND SEED QUALITY ON COTTON GROWTH, DEVELOPMENT AND YIELD

Mitchell K. Williams
Keith L. Edmisten
Guy D. Collins
Lori U. Snyder
Charlie Cahoon
Emily H. Griffith
Phillip S. Lassiter
Ethan R. Foote
North Carolina State University
Raleigh, NC

Abstract

Two of the most important aspects of cotton production are seed quality and weed control. Previous research has shown that poor quality seed (cool germination below 80%) can significantly lower seedling emergence and that plants from higher quality seed are consistently taller and more productive than plants from lower quality seed, especially when planting in suboptimal or cool conditions. Additionally, other stresses may further influence stand establishment and vigor, such as potential injury from residual pre-emergence herbicides. Field experiments were initiated in 2020 in North Carolina to investigate the additive effect or interactions between seed quality and residual herbicides on growth, development, and yield of cotton. We hypothesized that low quality cotton seed would have a significant negative impact on cotton growth, development, and yield; and adding high rates of pre-plant fomesafen + fluometuron to low quality cotton seed can exacerbate the impact on cotton growth, development, and yield. Three rates of fomesafen + fluometuron were applied representing 0, 1x, and 2x of a full rate. Five seed lots of the same variety with varying warm and cool germination percentages were planted. While little interaction was found from fomesafen + fluometuron rate, we found that cool germination percentage had the greatest effect on stand count, vigor, plant height and lint yield. In this study, this residual herbicide program resulted in little injury and minimal effect on stand count, vigor, plant height, and lint yield. There was no effect of seed quality (warm and cool germination percentage) on micronaire, fiber length, strength, or uniformity. Seed quality, especially cool germination, had a significant and lasting effect on stand establishment, seedling vigor, plant growth, and lint yield.