DOES A RYE COVER CROP CHANGE THE CRITICAL WEED-FREE PERIOD IN COTTON?

J. D. DeVore
J. K. Norsworthy
G. M. Griffith
S. K. Bangarwa
J. Still
D. B. Johnson
M. J. Wilson
E. K. McCallister
University of Arkansas
Fayetteville, AR

Abstract

The critical period of weed control (CPWC) is an estimate of the duration of effective weed control necessary to prevent weed interference from reducing yields (Hall et al. 1992). In order to design a management strategy that minimizes weed interference during the critical growth period of a crop, an understanding of the CPWC is essential. A field experiment was conducted at Marianna, AR, in which a rye cover crop was used to determine its effect on the critical weed-free period in cotton. This experiment was organized in a split plot design replicated three times. The main factor was the use of a rye cover crop. The subplot factor was the duration of the weed-free period and the duration of the weed-interference period. Both the weed-free period and the weed-interference period had durations of 0, 1, 2, 3, 4, 5, 7, 9 weeks and season long. Initial weed control consisted of Roundup WeatherMAX plus Dual Magnum followed by Roundup WeatherMAX as needed. Weed biomass was collected at each treatment in the weed-interference plots and once at the end of the growing season in the weed-free period plots. Yield data was collected in all the plots and all the data were subjected to regression analysis. Throughout most of the growing season, weed biomass in the presence of a rye cover crop was less than that in the absence of a rye cover crop. In weeks 2 through 7, there was at least a two-fold reduction in weed biomass in the presence of a rye cover crop compared to the absence of rye. In both the presence and absence of a rye cover crop, weed removal should begin prior to 108 g/m2 of weed biomass. As long as weed removal occurs on or before the third week after planting, yield loss will not be greater than 5%.