PLANT-ASSOCIATED FUNGI EFFECTS ON BOLL WEEVIL GROWTH

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Abstract

Our goal was to analyze whether cotton plants grown from seeds treated with plant-associated fungi negatively affect boll weevil growth. We compared the performance of weevils by infesting 45-day old cotton plants grown from seeds treated with one of several plant-associated fungi (Strains A, B, C, and D maintained in our lab, and the commercially available *Beauveria bassiana*) versus untreated control plants in cages under greenhouse conditions. Each cage contained one plant along with one fertilized boll weevil female and was checked daily to collect abscised squares and check for oviposition. From the infested squares, we recorded the developmental time, the number of larvae, body size, pupal weight, growth rate, longevity (days to adult death), sex ratio, and % mortality. We performed Kaplan-Meier Survival analysis with log-rank and a pairwise comparison with Bonferroni p-value adjustment to compare the developmental time between the treatments, and Pearson correlation to assess the relationship between the growth traits. We observed negative effects of fungal treatments on time to adult emergence, with weevils taking longer to reach the adult stage on all treatments relative to untreated controls. Despite the fungal effect on the developmental time, we could not find a correlation between the days to emergence and adult weight, body size and rostrum size, and pupal weight. Thus, we excluded the hypothesis that reduced growth rate on fungal-treated plants explains extended developmental time. Our results illustrate the potential for fungal cotton treatments to extend weevil generation times and negatively affect population growth in the field.