

THE EVALUATION OF A NEW BT TECHNOLOGY FOR THE CONTROL OF THRIPS AND TARNISHED PLANT BUGS

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Abstract

Thrips (Thysanoptera) are an important pest of cotton in Tennessee. In 2015, thrips were responsible for nearly 25% of the total bales of cotton lost to insect pests. In recent years, thrips control failures with neonicotinoid seed treatments have occurred in Tennessee and across the Mid-South. The loss of aldicarb as an in-furrow granular insecticide treatment combined with a lack of quality alternative treatments has made thrips management a key concern in this area. The tarnished plant bug (TPB), *Lygus lineolaris*, is the primary insect pest in Tennessee, accounting for roughly 45% of the bales of cotton lost to insect pests in 2015. Management of this pest is becoming increasingly difficult due to growing resistance to several classes of insecticides across the Mid-South and a lack of new effective modes of action to control the tarnished plant bug. Recently, Monsanto has been developing a Bt trait for the control of tarnished plant bug. This Bt trait expresses a toxin, Cry51Aa2 that also has insecticidal activity on thrips. Trials were conducted in Jackson, TN at the West Tennessee Research and Education Center in 2016 to determine the benefits of this new trait for the management of thrips and tarnished plant bugs. The trial was designed as a split-plot design with three main factors. Factor A was the level of TPB control: untreated control, insecticide applications made on TPB populations, and weekly automatic applications. Factor B was the trait: Bt vs. non-Bt. Factor C was the level of thrips control: IST + foliar application vs. untreated control. The Bt trait and the insecticide seed treatment similarly reduced thrips numbers compared with control plots, with the trait having lower thrips injury ratings. The trait combined with an IST plus a foliar application for thrips had the lowest level of thrips injury. The Bt trait significantly increased square retention in untreated plots by about 10% during the first three weeks of squaring. The trait also significantly reduced the total number of tarnished plant bugs, especially large nymphs. Based on current treatment thresholds, the Bt trait required three less insecticide applications for tarnished plant bug than non-Bt cotton in this trial. The trait also increased yield compared with non-Bt cotton not sprayed with insecticide for tarnished plant bug. However, insecticide applications for tarnished plant bug increased yield on both the Bt and non-Bt cotton.