

DURATION OF BACTERIAL SURVIVAL ON COTTON LEAF SURFACES
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Abstract

Pix (mepiquat chloride) is a plant growth regulator commonly used in cotton (*Gossypium hirsutum* L.) production to manage plant height and control rank vegetative growth. Pix Plus is a combination of mepiquat chloride and live *Bacillus cereus* endospores. Pix Plus has been associated with cotton plant responses that differ from mepiquat chloride, which range from increased vegetative and reproductive growth to providing positive effects on final yield. There is little known about the mechanism or relationship involved with *Bacillus cereus* and cotton, which led to the interest in developing this study. The objectives are to monitor the population and determine any effects additional *Bacillus cereus* applied as a wettable powder, BP01, may have on cotton growth and production. Field studies were conducted in 2001 and 2002 at the Cherry Farm Unit in Goldsboro, North Carolina. Cultivar 'DPL 451 B/RR' was planted and managed according to North Carolina Extension Recommendations in a randomized complete block design with four replications. Treatments consisted of an untreated check, Pix, and Pix Plus applied at PHS, EB, and three to four weeks after EB. Additional treatments of either 1 oz BP01 A⁻¹, or 2 oz BP01 A⁻¹ were combined with and without Pix. All applications were made with a backpack CO₂ pressured broadcast boom delivering 15 gallons per acre. Two-ounce BP01 treatments were only used in 2001. Background microbe counts were taken before BP01 application. Additional microbe samples were taken 1, 3, 24, 72, and 192 hours after application. Samples were obtained by randomly cutting 5 leaf disks within a plot, and storing them in a sterile buffer solution. These samples were stored on liquid nitrogen, and plated within 6 hours. Serial dilutions of the samples were plated on tripticase soy agar with two replications per sample. Plates were incubated at 35°C for 12 hours. Data were analyzed in SAS version 8e under the general linear model. Means were separated by Fisher's protected LSD at $\alpha=0.05$. Regression of the logarithm of colony counts over the logarithm of time after treatment showed linear decline in *Bacillus cereus* populations with R² values for the 1 and 2 oz BP01 applications in 2001 to be 93.5% and 99.2% respectively, and 96.3% for Pix Plus in 2002. A rate response in population count was evident between the 1 and 2 oz BP01 treatments for 24 hours. Lint yield ranged from 1540 to 1815 lbs A⁻¹ in 2001 and 780 to 1007 lbs A⁻¹ in 2002, however, no treatment differences were detected for cotton yield in either year.