

# EVALUATION OF BOLL MATERIAL UNDER PARTIALLY DETACHED BLOOMS IN BT COTTON

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## Abstract

A preliminary experiment was conducted in the summer of 2001 to examine the levels of Cry1Ac under partially detached blooms from bolls of transgenic *Bacillus thuringiensis* (Bt) cotton. Previous studies with Bt corn have shown that non-photosynthesizing tissue contains significantly less amounts of Cry protein than normal tissue. Therefore, since Lepidoptera such as bollworms and fall armyworms are primarily fruit feeders, these pests may be able to penetrate areas on cotton bolls that do not express significant levels of Cry1Ac (i.e. non-photosynthesizing areas under partially detached corolla) to provide mortality or at least some degree of suppression. Transgenic Bt cotton varieties (5) containing Cry1Ac were planted in experimental plots arranged in a randomized complete block design. A 60 X 90' caged was erected, and the entire test was covered with netting. This allowed sunlight to be reduced considerable while maximizing humidity, causing a large percentage of flowers to remain attached to boll tips. For each plot, normal bolls and bolls containing partially detached blooms (5 each/variety) (Figure 1.) were collected and transported to the laboratory. The tips were dissected away from the remaining boll material, pooled for each variety, and the amount of Cry1Ac quantified (Envirologix, Inc., Portland, ME) (Figure 2). Normal boll tips contained significantly more Cry1Ac than bolls containing partially detached blooms (Table 1, Figure 3). These investigations will be repeated in 2002, and also expanded to examine lepidopteran performance and mRNA levels of Cry1Ac.

Table 1. Mean Levels of Cry1Ac Found in Normal Bolls vs. Bolls with Partially Detached Blooms.

<i>Boll Type</i>	<i>Mean (ppm)</i>	<i>Std Err</i>	<i>CV</i>
<b>Normal</b>	1.68	0.079	10.569
<b>Detached</b>	1.47	0.101	15.307
<b>n=5;df = 1, 4</b>			
<b>F = 33.25</b>			
<b>P = 0.004</b>			

(PROC MIXED; SAS Institute).

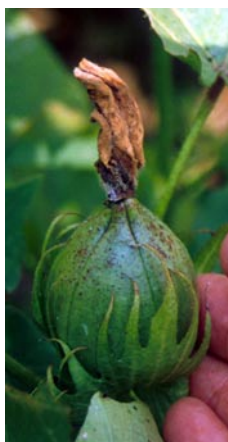


Figure 1. Cotton boll with a partially detached bloom.

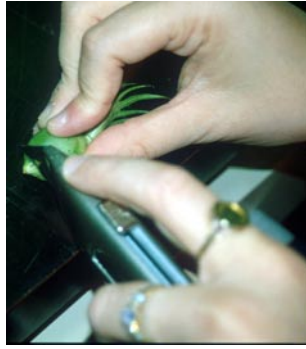


Figure 2. Dissection of a boll tip from underneath a partially detached bloom.

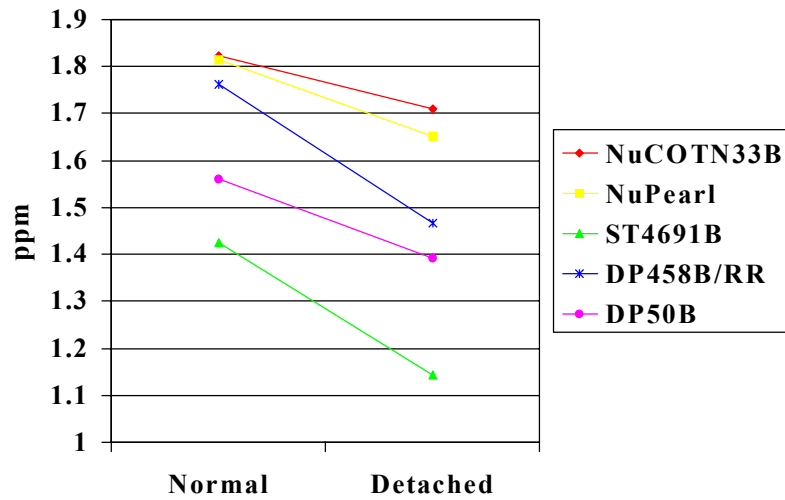


Figure 3. Amount of Cry1Ac in normal bolls vs. bolls with partially detached blooms.