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ANALYSIS OF FRUIT RETENTION PATTERNS FOR BOLLGARD II™, BOLLGARD® AND NON-BOLLGARD COTTON INSECT CONTROL SYSTEMS

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Abstract

Field studies were conducted at one hundred six locations in eleven states comparing the fruit retention of five Bollgard II, eleven Bollgard and nine non-Bollgard varieties. Bollgard II fruit retention on DPL 50 BIIR has been compared to Deltapine 50 BR and Deltapine 50 from 2000 until 2002. Bollgard II was deregulated and launched in 2003. This enabled Bollgard II to be tested in more diversified genetic background across a broad geography. All comparisons were made under large plot or field-size, grower conditions in LA, MS, AR, TN, AL, GA, NC, SC, OK and TX. All locations compared Bollgard II with Bollgard or non-Bollgard varieties. Most locations included comparisons of a Bollgard II, Bollgard and a non-Bt variety. Each technology was managed for heliothine pest using IPM established thresholds. Ten to twenty plants were selected from each treatment at each location. Boll retention after physiological cutout was recorded by node and position on each plant. Locations and plants were used as replicates. ANOVA was conducted for boll retention least square means at each node and position for each technology to determine differences ($p>0.05$). Fruit retention comparisons were made for nodes six though fifteen due to the relative importance of these nodes in contribution to lint yield.

All three technologies initiated (> 31%) first position fruit set on node six in 2003. Bollgard II varieties retained 34% harvestable bolls at the sixth node and 57 % at the eleventh node when compared to Bollgard variety retention of 31% and 54 % at these respective nodes. These were the only nodes where Bollgard II first position fruit retention was significantly superior to Bollgard. Bollgard II varieties averaged higher fruit retention at eight of the ten first position sympodia at nodes six to fifteen when compared to Bollgard varieties.

Bollgard II cotton varieties had significantly higher fruit retention at all first position sympodial nodes six through fifteen when compared to non-Bollgard varieties. Bollgard had significantly higher percent retention at all nodes except node six when compared to non-Bollgard. The improved retention of both the Bollgard and Bollgard II technology was greatest for first position sympodial nodes nine through twelve. Similar trends were seen in second and third position fruit retention.

First position fruit retention averaged 49% at sympodial nodes six to fifteen across all technologies. Second and third position fruit retention was 27.7% and 13% percent respectively. Bollgard II varieties averaged 51% first position and 29% second position retention at sympodial nodes six to fifteen. Bollgard varieties averaged 49% first position and 27% second position while non-Bollgard varieties averaged 44% and 27% fruit retention at the same nodes.

Third position fruit retention for Bollgard II, Bollgard and non-Bollgard varieties averaged 12%, 11% and 13%, respectively. Non-Bollgard plants exhibited compensatory fruit retention at third position sympodial nodes resulting from bolls that were lost from prior developing first and second position bolls.