

**LINT YIELD RESPONSE OF BOLLGARD® (BG),
ROUNDUP READY® (RR), AND BG/RR COTTON
UNDER IRRIGATION IN OKLAHOMA**
Laval M. Verhalen, Bruce E. Greenhagen
and Robert W. Thacker
Oklahoma State University
Stillwater and Altus, OK

Abstract

Experiments were conducted to determine whether BOLLGARD® (BG) has a positive, neutral, or negative effect on cotton (*Gossypium hirsutum* L.) lint yield under irrigation in Oklahoma and to do likewise for ROUNDUP READY® (RR) and for BG/RR. To accomplish those objectives, replicated trials were planted in 1998 and 1999 near Altus and Tipton, OK using the recurrent parents and their corresponding transgenic versions that were available to us. Families represented in the experiments in one or both years included 'PM 1215', 'PM 1220', 'PM 1244', 'PM 2326', and 'DP 5415'. Experimental designs used were split-plots with whole plots randomly assigned to genetic backgrounds and subplots randomly assigned to individual varieties on that background. Whole plots were arranged in a RCB with 10 replications. Subplots were individual rows, 30 ft. long, and 40 in. apart.

BG increased lint yield in three of four experiments (from 6.7 to 11.8%) compared to the recurrent parents PM 1215 and DP 5415. No significant interactions with genetic background were detected for this gene. RR decreased lint yield of PM 1220 in two experiments (from -7.3 to -22.2%) but increased it (12.7%) in another. An increase of 10.5% was noted for PM 1244 in one trial. No effects were detected in PM 1215 and DP 5415. Significant interactions with genetic background were detected for RR in three of the four experiments. BG/RR increased lint yield in PM 1220 (from 10.0 to 22.2%) compared to RR in two of four experiments; it increased yield in PM 1244 (from 6.4 to 12.9%) relative to RR in three of them. No effects were detected in PM 2326. Significant interactions between BG/RR vs. RR were observed in two of the four trials. BG/RR increased lint yield (11.7%) in PM 1220 in one experiment compared to the recurrent parent and in PM 1244 (from 12.4 to 23.8%) in three of four experiments. Significant interactions between them were observed in three of four environments.

BG (alone or in combination with RR) may or may not increase lint yield in cotton. BG gave the same reaction on both genetic backgrounds studied. RR may or may not increase (or decrease) lint yield in cotton. Because of the large decreases observed in these tests for 'PM 1220 RR', another variety should probably be grown in its place. RR (alone or in combination with BG) frequently displayed significant interactions with genetic backgrounds indicating that the expression of that gene is influenced by genetic background.