

# 2008 Research Summary



**The Learning Center at Scott, Mississippi**

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## Effect of PGR Strategies on the Yields of New Cotton Varieties



A key factor in producing high yielding cotton is managing the perennial and indeterminate growth habit of the cotton plant with plant growth regulators (PGRs). Proper use of PGRs can be critical for maximizing yields in any given year and mismanagement of PGRs can result in reduced yields. When determining the proper application timing of PGRs, several factors such as soil type, soil fertility, irrigation and field history should be taken into account. Environmental factors can also influence PGR strategies and their effectiveness. However, understanding a particular variety's growth habit and its response to a PGR application is one of the most important factors in developing sound plant growth management strategies. Plant response to PGRs can vary depending on the cotton

variety, plant genetics and the environment during and after application. This makes a blanket recommendation very difficult and often impractical.

### Study guidelines

In order to better understand the growth habits and response of the new Deltapine® Class of '09 cotton varieties, studies were carried out at The Learning Center at Scott, MS to investigate the effects of light and heavy PGR management strategies. Five new Deltapine Class of '09 varieties (DP 0912B2RF, DP 0924B2RF, DP 0924B2RF, DP 0935B2RF and DP 0949B2RF) and a check (DP 555 BG/RR) were planted into irrigated and non-irrigated studies on a silty loam soil on May 12<sup>th</sup>. Experimental designations and the corresponding commercial designations are given in Table 1. The field was fertilized with 120 lbs of nitrogen per acre, 30 lbs of phosphorus per acre, and 120 lbs of potassium per acre. The irrigated portion of the study received 5 irrigations and the trial location received 15 in of rain during the growing season. Cotton varieties were set up in 8 row plots with 4 rows receiving the light management strategy and 4 rows receiving the heavy management strategy. For the light PGR strategy, 16 fl/oz of Pix® per acre and was applied at early bloom. In the heavy Pix strategy, 8 fl/oz per acre was applied at matchhead square, 16 fl/oz at early bloom, and 16 fl/oz at mid bloom. Plots were harvested with a commercial cotton picker adapted to harvest individual plots. Seed cotton was ginned and weighed in Scott, MS to determine lint yield per acre.

### Study Results

Responses of the various varieties were consistent across both the non-irrigated and irrigated plots (Figures 1 & 2) as relative yield differences were similar with respect to PGR strategy regardless of water inputs. Low PGR strategies resulted in numerically higher yields for four of the five new Class of '09 varieties across both water regimes. DP 0935B2RF brand was the exception to this trend as it had numerically higher yields with the high PGR regime with lint yields of 10 and 23 lbs/A more. The largest differences seen between the two PGR regimes were among DP 0920B2RF at 167 and 148 lbs/A and DP 0949B2RF brands at 273 and 151 lbs/A. DP 555BR performed as expected as it had higher yields with more PGRs applied resulting in a 27 and 177 lb/A yield advantage.

### Conclusions

As expected, the cotton varieties responded differently to PGR applications. The similar trends between the non-irrigated and irrigated plots suggest a level of continuity in the research results. In seven out of twelve comparisons between the high and low PGR strategies, yield differences were less than 70 lbs/A. The largest yield differences among the new varieties were seen between DP 0949B2RF and DP 0920B2RF, suggesting that lower total amounts of PGRs may be a good tool to maximize yield potential of these varieties. Care should be taken to monitor all varieties with respect to their growth patterns; looking at 4th and 5th internode distances, soil moisture, agronomic

2008	2009
Experimental Designation	Commercial Brand
07W505B2R2	DP 0912B2RF
07W901B2R2	DP 0920B2RF
	DP 0924B2RF
	DP 0935B2RF
07W514B2R2	DP 0949B2RF

Table 1. 2008 experimental designations as listed at the Learning Center at Scott, MS and 2009 commercial brand names given to the cotton varieties in this experiment.



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practices and weather patterns to make PGR application decisions on these and all cotton varieties. This study gives a snapshot of only one growth environment, of location and year, but may provide insight into general recommendations of what to look for in the Deltapine Class of '09 varieties.

*Note: These results are not intended to provide you with a blueprint on how to grow any specific variety but merely to give the benefit of some research with them. Your experience and knowledge will remain an invaluable component to the successful management of any variety. This information is being provided to you to aid you in making decisions and giving advice regarding the management of these varieties. The information is not intended to totally supplant your experience and knowledge base on the proper management of your individual crops.*

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**Scott MS 2009; Individual results may vary**, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

Growers may utilize the natural refuge option for varieties containing the Bollgard II® trait in the following states: AL, AR, FL, GA, KS, KY, LA, MD, MS, MO, NC, OK, SC, TN, VA, and most of Texas (excluding the Texas counties of Brewster, Crane, Crockett, Culberson, El Paso, Hudspeth, Jeff Davis, Loving, Pecos, Presidio, Reeves, Terrell, Val Verde, Ward and Winkler). The natural refuge option does not apply to **Bollgard II** cotton grown in areas where pink bollworm is a pest, including CA, AZ, NM, and the above listed Texas counties. It also remains the case that **Bollgard® and Bollgard II** cotton cannot be planted south of Highway 60 in Florida, and that **Bollgard** cotton cannot be planted in certain other counties in the Texas panhandle. Refer to the Technology Use Guide and IRM Guide for additional information regarding Bollgard II, Bollgard, natural refuge and EPA-mandated geographical restrictions on the planting of Bt cotton. **ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Roundup Ready® crops contain genes that confer tolerance to glyphosate, the active ingredient in Roundup® agricultural herbicides. Roundup® agricultural herbicides will kill crops that are not tolerant to glyphosate. Bollgard II and Design®, Growing Knowledge and Design®, Respect the Refuge and Cotton Design®, Roundup®, Roundup Ready®, and Monsanto imagine® and Vine Design® are registered trademarks of Monsanto Technology LLC. Deltapine® is a registered trademark of D&PL Technology Holding Company, LLC. All Other Trademarks are property of the respective owners. ©2009 Monsanto Company.

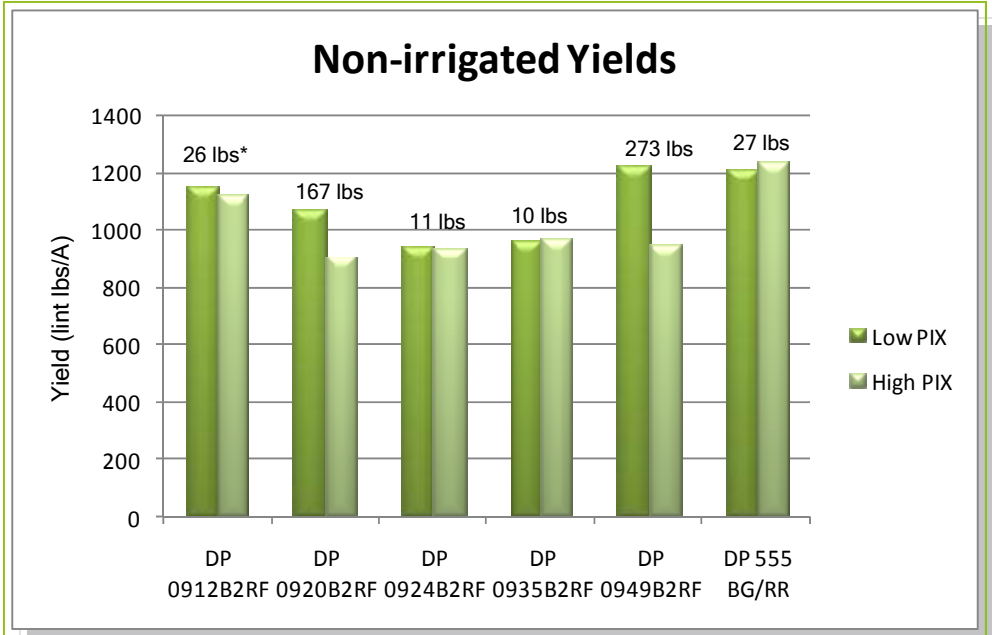


Figure 1. Non-irrigated lint yields of cotton varieties across two different PGR regimes. \*Positive yield difference in lint lbs/A of the best PIX regime.

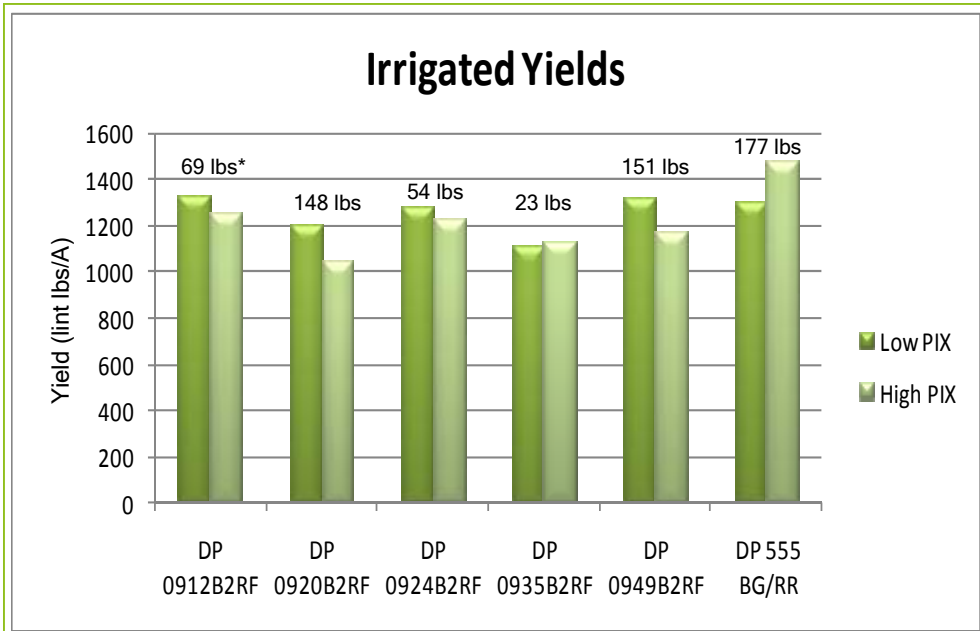


Figure 2. Irrigated lint yields of cotton varieties across two different PGR regimes. \*Positive yield difference in lint lbs/A of the best PIX regime



Before opening a bag of seed, be sure to read and understand the stewardship requirements, including applicable refuge requirements for insect resistance management, for the biotechnology traits expressed in the seed as set forth in the Monsanto Technology Agreement that you sign. By opening and using a bag of seed, you are reaffirming your obligation to comply with those stewardship requirements.