2011 LEARNING CENTER
at Scott, Mississippi
DEMONSTRATION REPORT

DELTAPINE®

EFFECT OF PGR STRATEGIES ON COTTON YIELD POTENTIAL

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, such as mepiquat chloride (Pix®), can be critical to help maximize yield potential in any given year, while the mismanagement of PGRs can result in reduced yield potential. When determining the proper application timing of PGRs, several factors such as soil type, soil fertility, irrigation, and field history should be considered. Environmental factors can also influence PGR strategies and their effectiveness. However, understanding a particular variety's growth habit and response to a PGR application is one of the most important factors in developing sound PGR management strategies. Plant response to PGRs can vary depending on the cotton variety, plant genetics, and the environment during and after application. This makes blanket PGR recommendations very difficult and often impractical.

DEMONSTRATION GUIDELINES

In order to better understand the growth habits and response of the Deltapine® Class of 09, 10, 11, and 12 cotton varieties, a study was conducted at the Learning Center at Scott, MS to investigate the effects of passive and aggressive PGR management strategies. Seven cotton varieties were planted at 42,000 seeds/acre on May 9, 2011 and the trial was irrigated (Table 1).

Deltapine® Cotton Varieties

Class of 09	Class of 10	Class of 11	Class of 12
DP 0912B2RF	DP 1028 B2RF	DP 1133 B2RF	DP 1252 B2RF
	DP 1034 B2RF	DP 1137 B2RF	
	DP 1048 B2RF		

Table 1. Deltapine cotton varieties in PGR management strategy demonstration.

Cotton varieties were planted in 12 row plots with 4 rows receiving the aggressive PGR management strategy, and 4 rows receiving the passive PGR management strategy and 4 rows left as an untreated check. The passive and aggressive treatments of a 4.2% mepiquat chloride are provided in table 2. The passive treatment was designed to be optimal for less aggressive growing varieties and less than optimal for more aggressive growing varieties. Plots were harvested with a commercial cotton picker. Seed cotton was ginned and weighed to determine lint yield per acre.

PGR Management Strategies
(4.2% mepiquat chloride)

PGR Strategy	Timing (nodes)	Date	Rate
Passive	12 nodes	June 30	8 oz/acre
	15 nodes	July 8	8 oz/acre
	20 nodes	July 21	16 oz/acre
Aggressive	8 nodes	June 17	8 oz/acre
	12 nodes	June 30	16 oz/acre
	20 nodes	July 21	20 oz/acre

Table 2. Timing, date, and rate of the passive and aggressive PGR management strategies.

RESULTS

Not all varieties respond similarly to the same to PGR applications, so measuring and comparing actual growth can help indicate the agronomic status of a field. PGR management strategies have traditionally been learned by producers during the first few years after introduction. This demonstration is an attempt to help learn and apply specific management strategies earlier in the life cycle of the cotton product.

Cotton varieties selected for the trial differed in response to PGR management strategies (Figure 1). A passive PGR strategy resulted in a higher final yield for five of the seven selected varieties, while two cotton varieties produced higher yields with the more aggressive PGR management strategy.

The largest yield difference when comparing the same variety across the two PGR regimes was 275 lbs lint/acre for DP 0912 B2RF, which yielded more under the aggressive PGR strategy. DP 0912 B2RF is an early maturing cotton variety, which may have responded favorably to the aggressive treatment during 2011 due to the relatively early heat unit accumulation which characterized the 2011 growing season. The largest difference in favor of the passive PGR management strategy was 114 lbs lint/acre for DP 1028 B2RF.

The different PGR management strategies also affected the height of cotton plants at harvest. All cotton varieties reported the tallest plants in the untreated check (UTC) (Figure 2). Six of the seven varieties reported shorter cotton plant height under the aggressive PGR management strategy. Cotton varieties DP 1028 B2RF, DP 1034 B2RF, and DP 1133 B2RF all reported a high percent

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Technology Development by MONSANTO ®

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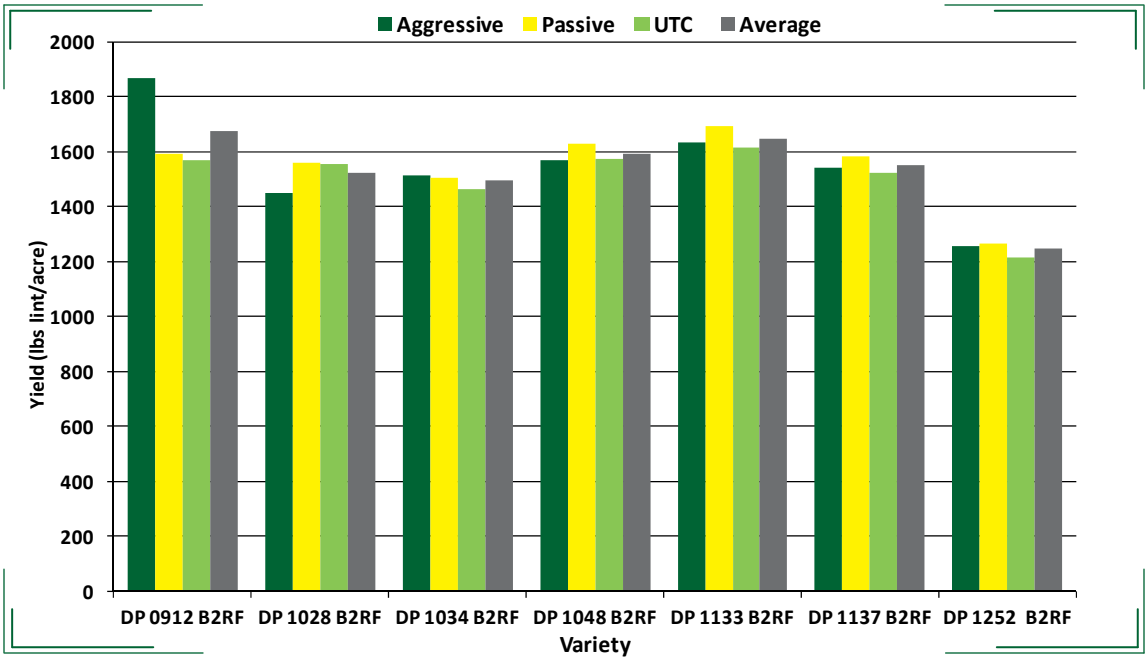

Figure 1. Effect of PGR strategies on yield (lbs lint/acre) of Deltapine® Class of 09, 10, 11, and 12 cotton varieties. UTC = untreated check

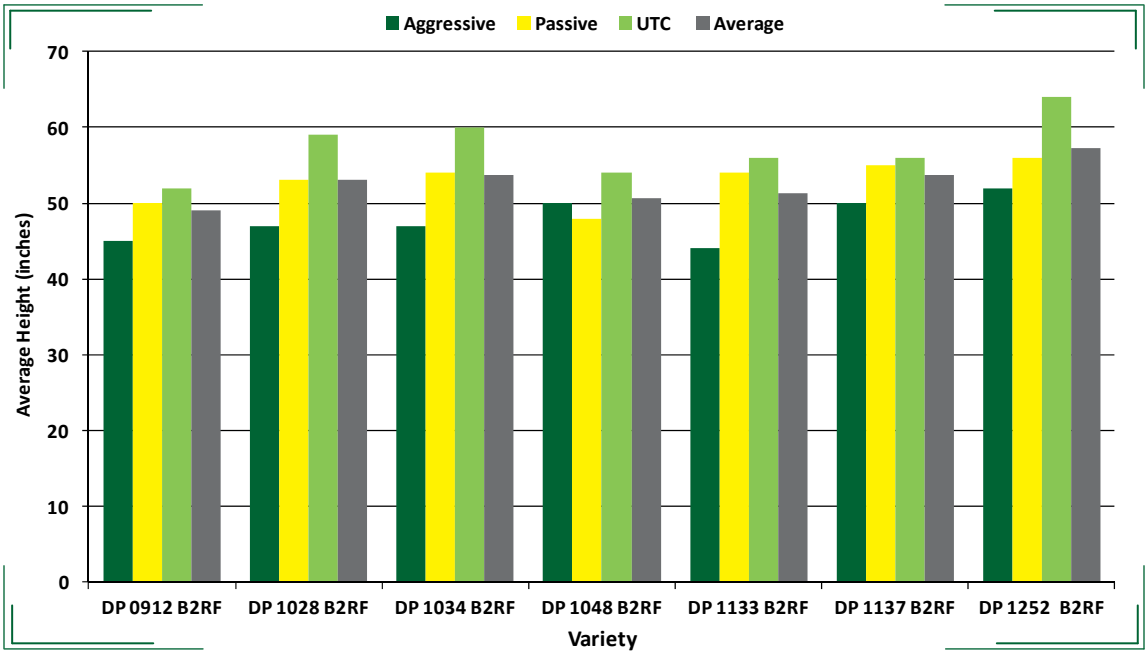

Figure 2. Effect of PGR strategies on harvest height (inches) of Deltapine® Class of 09, 10, 11, and 12 cotton varieties. UTC = untreated check

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EFFECT OF PGR STRATEGIES ON COTTON YIELD POTENTIAL

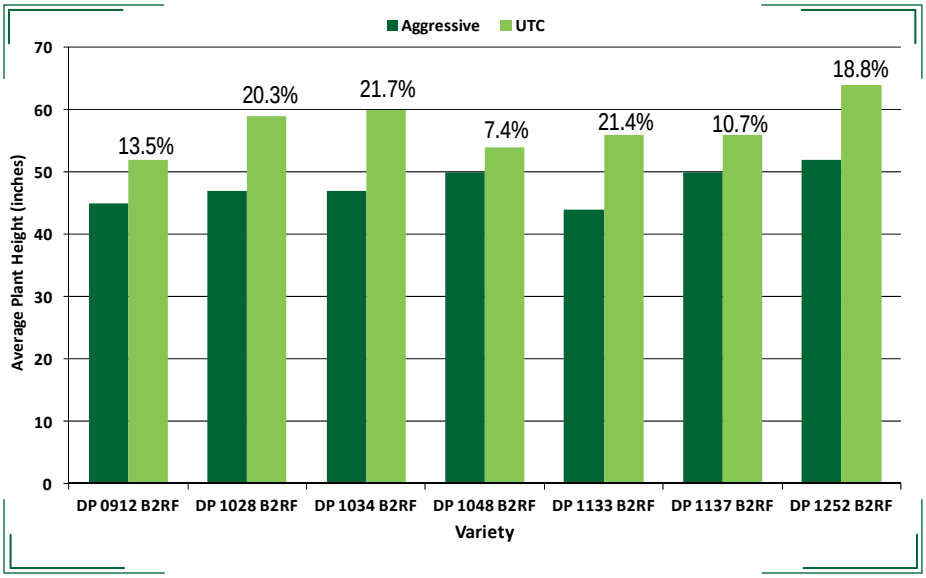

Figure 3. Average percent height reduction when comparing the harvest height (in inches) of the aggressive PGR management strategy to the untreated check.

height reduction for the aggressive PGR strategy compared to the untreated check (Figure 3). Shorter plant height generally indicates a reallocation of photosynthate into non-vegetative development and may increase harvest efficiency for producers.

CONCLUSIONS

As expected, not all cotton varieties responded the same to PGR applications. In five out of seven comparisons between the aggressive and passive PGR management strategies, yield differences were less than 60 lbs lint/acre. Of the tested varieties, DP 0912 B2RF produced the highest overall yield at 1867 lbs lint/acre under the aggressive PGR strategy. This suggests that during 2011, DP 0912 B2RF may have had very strong early season growth, which required higher PGR rates and frequent applications to adequately manage vegetative growth. When comparing yield to the harvest height of the cotton varieties, the second shortest variety at harvest, DP 0912 B2RF, with the aggressive PGR strategy had the highest yield, while the tallest variety, DP 1252 B2RF as an untreated check had the lowest yield. These results would suggest that boll rot or other yield-reducing factors may have had an effect on taller cotton plants.

Care should be taken to observe all varieties with respect to their growth patterns. When making PGR application decisions on these and all cotton varieties, remember to look at the node elongation of node 4-5 from the top of the plant, soil moisture, agronomic practices and weather patterns. This study gives a snapshot of responses in only one growth environment, location and year, but may provide insight into recommendations of what to look for in growth and development of the Deltapine® Class of 09, 10, 11, and 12 cotton 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.

The information discussed in this report is from a single site, non-replicated, one-year demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.