



VARIETY X POPULATION X PGR IN COTTON

Over the last 20 years, planting seed quality in cotton has improved due to several factors including better seed processing techniques and improvements in seed treatment fungicides/technology. Optimal plant populations in the field have become easier to achieve due to the aforementioned reasons, as well as later planting dates and less disease pressure. Additionally, reduced phytotoxicity from residual herbicide applications has improved cotton stands.

Many of the varieties today are less determinate and respond to lower populations with a reduced tendency to have excessive agronomic growth. The opposite is true in higher populations where vegetative growth can become very difficult to manage, particularly in the event of insect- or climate-induced fruit shed. For these reasons, many growers are planting reduced populations. These populations are in the 40,000 seeds/acre range versus the historical 55,000 seeds/acre. In 2011, the Scott Learning Center evaluated the interaction of cotton variety, population, and plant growth regulator (PGR) use on cotton height at cutout and lint yield.

STUDY GUIDELINES

A demonstration trial was conducted at the Monsanto Learning Center in Scott, Mississippi to evaluate the effects of cotton variety, plant population, and PGR rates/timing on plant height at cutout and lint yield. Numerous growers in the South fluidly move from cotton to corn and vice versa. For this reason, understanding how the two crops are different with respect to emergence and population is important.

Four Deltapine® cotton varieties were planted at seeding rates of 28,000; 41,000; and 55,000 seeds/acre (Table 1). These populations represented 2, 3, and 4 seeds/foot. Two PGR regimes were implemented: passive and aggressive (Table 1). All varieties

were Genuity® Bollgard II® with Roundup Ready® Flex cotton. Planting occurred on May 12, 2011 and harvest was September 20. Plant height at cutout and yield data were collected.

RESULTS

Population. Across both PGR treatments, acceptable yields were achieved even at the lowest population. At 28,000 seeds/acre, cotton yield was 2103 lbs lint/acre, while yields were 1957 and 2166 lbs lint/acre at 41,000 and 55,000 seeds/acre, respectively, when averaged across PGR treatments.

On average, 68% of the seed planted produced a plant for harvest. Emergence conditions were very good this season. This cotton stand result is similar to the 70% average observed at the Scott Learning Center; however, it is much lower than the 99% emergence observed in corn at the Scott Learning Center.

PGR. Across populations, the aggressively treated cotton yielded slightly more than the passively treated cotton (Figure 1). When averaged across populations, the aggressive PGR system (2097 lbs lint/acre) yielded 43 lbs lint/acre more than the passive system (2054 lbs lint/acre).

Plant height was reduced more in the aggressive system (average plant height of 54 inches) than in the passive (average plant height of 60 inches), but it varied with the growth habit of the variety (Figure 2). Large differences in average plant height were not observed across populations in either the aggressive PGR or passive PGR system (Figure 2).

Table 1. Description of variables evaluated in this study.

COTTON VARIETIES	<ul style="list-style-type: none"> ■ DP 1034 B2RF ■ DP 1048 B2RF ■ DP 1133 B2RF ■ DP 1137 B2RF
SEEDING RATE	<ul style="list-style-type: none"> ■ 28,000 seeds/acre ■ 41,000 seeds/acre ■ 55,000 seeds/acre
PGR REGIME	<p>Passive:</p> <ul style="list-style-type: none"> ● 8 oz on June 30 ● 12 oz on July 8 <p>Aggressive:</p> <ul style="list-style-type: none"> ● 8 oz on June 17 ● 12 oz on June 30 ● 12 oz on July 8 ● 16 oz on July 27

to pg. 2



VARIETY X POPULATION X PGR IN COTTON

▶ from previous page

Variety. All four varieties yielded very well in the demo, with average yields ranging from 1848 lbs lint/acre in DP 1137 B2RF to 2245 lbs lint/acre in DP 1048 B2RF. Most of the varieties follow the trend of needing more aggressive PGR management at higher populations but to varying degrees depending on determinancy level (Figure 3).

All varieties in the aggressive PGR system responded similarly with shorter plant height compared to the passive PGR system (Figure 4). Additionally, the average plant height for all 4 varieties in the aggressive treatment was very similar; 55 inches for all varieties but DP 1133 B2RF, and it was 53 inches.

Population x PGR. Important trends were observed when examining population x PGR system. Low populations yielded better in the passively managed PGR system (Figure 1). Mid populations were somewhat indifferent to PGR management regime. Higher populations typically yielded more when aggressively managed with PGR.

CONCLUSIONS

While corn yield potential can be limited from the start of the season if the desired stand is not achieved, changes in cotton population may force shifts in management to make a cotton crop successful. This difference between corn and cotton allows for cotton management changes in response to planted vs. emerged populations.

In general, cotton responded positively in yield to:

- Reduced PGR applications at lower populations (Figures 1 and 5).
- More aggressive PGR applications at higher populations (Figures 1 and 5).

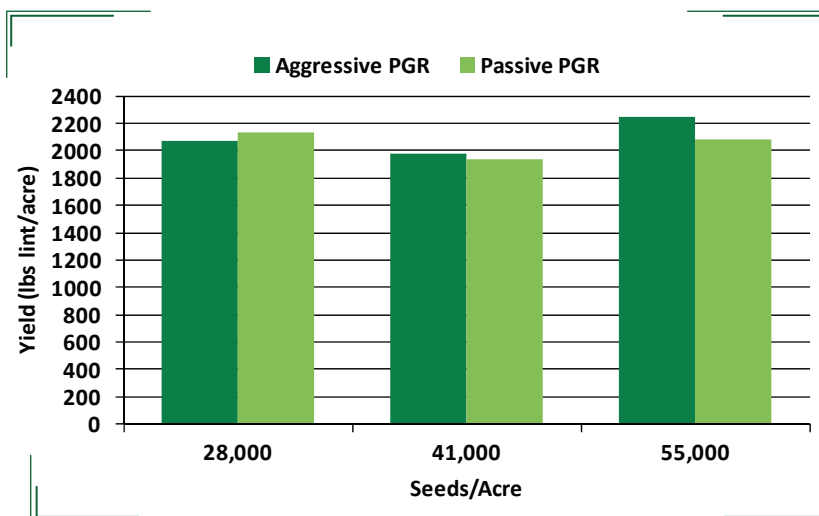


Figure 1. Effect of PGR regime on cotton lint yield at each seeding rate.

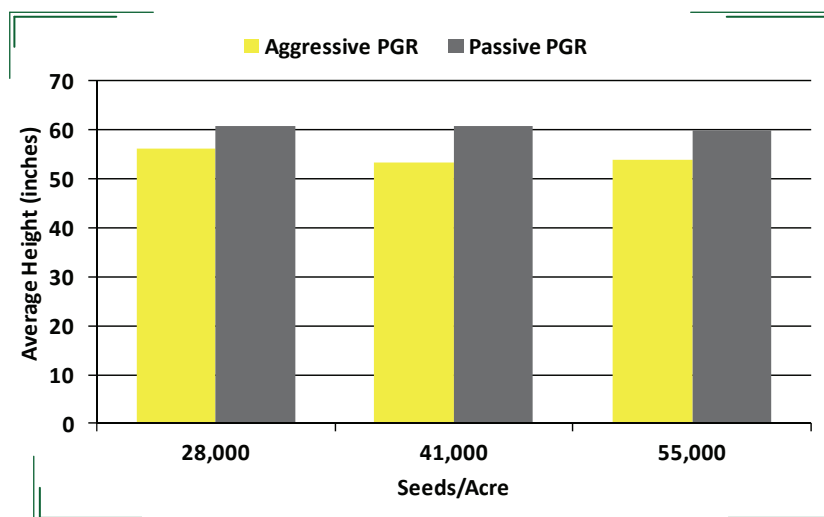


Figure 2. Effect of PGR regime on average cotton height at cutout.

to pg. 3 ▶



VARIETY X POPULATION X PGR IN COTTON

▶ from previous page

This relationship can allow growers to design a management system suited to their farm based on the following:

- Yield goals.
- Variety selection/adaptation. Variety selection is important and this demo points out the fact that varieties are not all the same. DP 1133 B2RF is an example of the exception. It responded positively to aggressive PGR management at all populations (Figure 5).
- Tolerance of risk from weather x variety x management style. For example, DP 1048 B2RF at high populations with aggressive PGR application was the highest yielding in this demo at 2601 lbs lint/acre (Figure 5) and 56 inches at cutout (Figure 6). Managing DP 1048 B2RF for higher yield could require a somewhat more aggressive management style to drive earliness and ensure optimal harvestability at season's end. DP 1034 B2RF at low populations with reduced PGR applications still made 4+ bales (2092 lbs lint/acre), was 63 inches at cutout, and likely carries the lowest risk in the group (Figures 5 and 6). As a result, either the higher input or lower input system can be a successful production system depending on the management applied to each field and variety by an individual grower.

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.

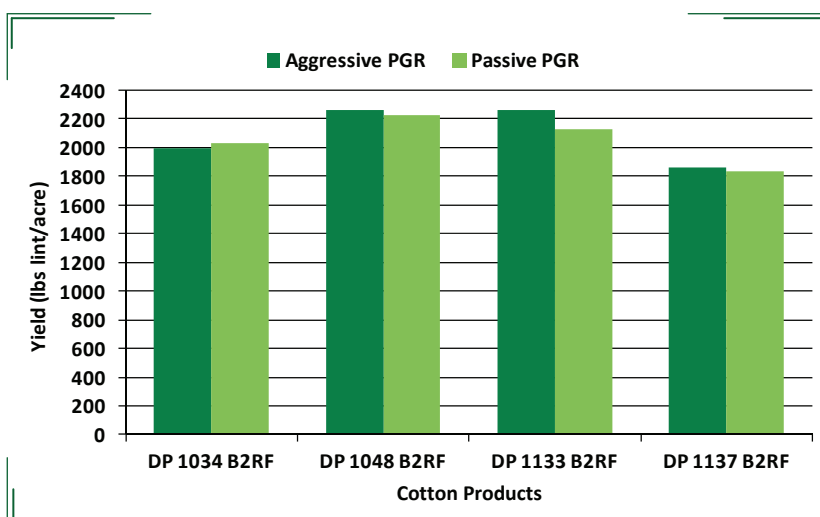


Figure 3. Effect of PGR regime on lint yield for each cotton variety.

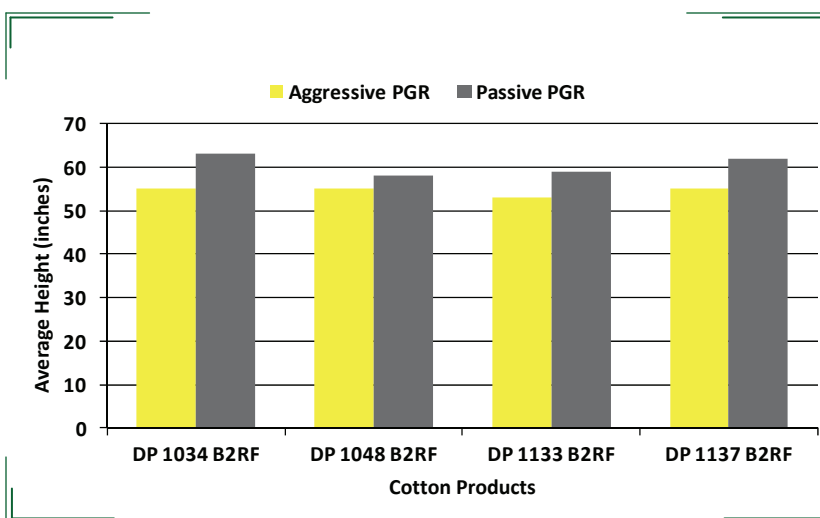


Figure 4. Effect of PGR regime on average cotton height for each cotton variety.

to pg. 4 ▶

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DEMONSTRATION REPORT



VARIETY X POPULATION X PGR IN COTTON

▶ from previous page

Figure 5. Effect of cotton variety x population x PGR regime on cotton lint yield.

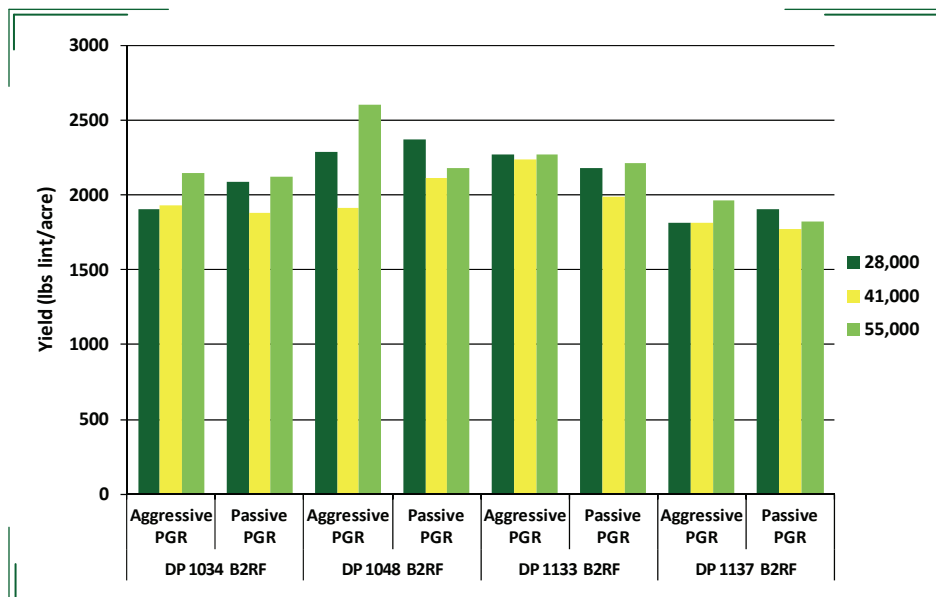
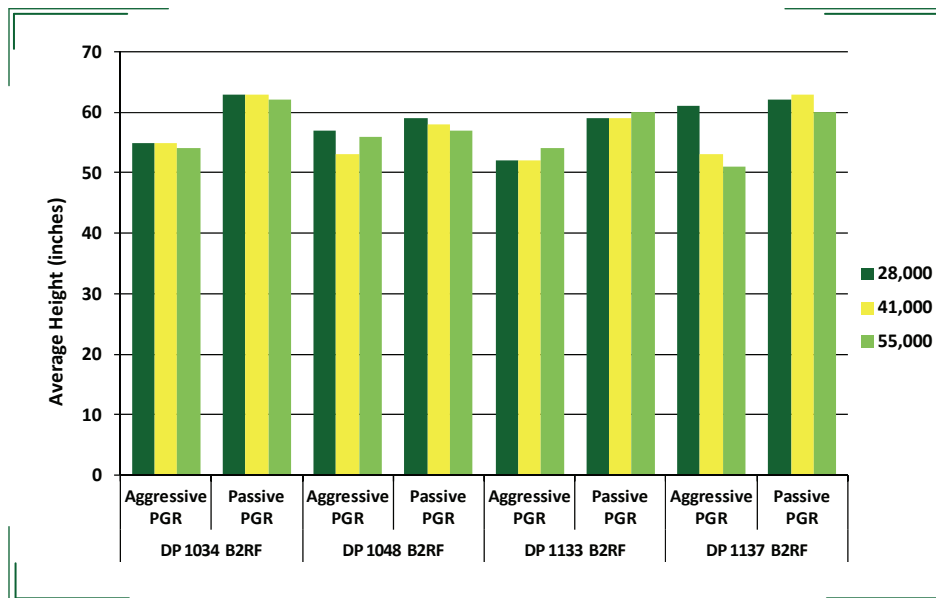


Figure 6. Effect of cotton variety x population x PGR regime on average cotton height.



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