



Response of Deltapine® Cotton Varieties to Different PGR Regimes

2016 Learning Center Demo Report
Monsanto Learning Center at Scott, MS



BACKGROUND

- Cotton varieties respond differently to plant growth regulator (PGR) treatments.
 - PGRs are used to help force a shift from vegetative to reproductive growth to establish acceptable yield potential.
 - It is important to understand the response of new cotton varieties to different PGR application techniques (timing and rates).
 - Varieties today are less determinate than many in the recent past. For that reason, sound PGR management is essential, especially during seasons like 2016 that favor strong vegetative growth.



STUDY GUIDELINES

- This trial was set up to provide strong growth conditions. The following parameters were used:
 - Mid planting date which allowed a relatively high amount of early-season heat accumulation.
 - Planted on May 11, 2016.
 - High population.
 - 52,000 seeds/acre.
 - High nitrogen fertility.
 - 120 lbs N as 28% liquid UAN
 - Following soybeans.
 - Fully irrigated.
 - Mid-season rainfall, diseases (target spot), and associated fruit shed made PGR management even more important during 2016.
- Harvest date: October 5, 2016.

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STUDY GUIDELINES

- Treatment List:
 - Untreated check (UTC) – No growth control
 - Aggressive regime –
 - Season total of 48 ounces/acre of Pentia™ plant regulator (Mepiquat pentaborate).
 - June 13 (16 ounces/acre)
 - June 22 (16 ounces/acre)
 - July 8 (16 ounces/acre)
 - Passive regime –
 - Season total of 48 ounces/acre of Pentia plant regulator (Mepiquat pentaborate).
 - June 27 (12 ounces/acre)
 - July 8 (16 ounces/acre)
 - July 14 (20 ounces/acre)

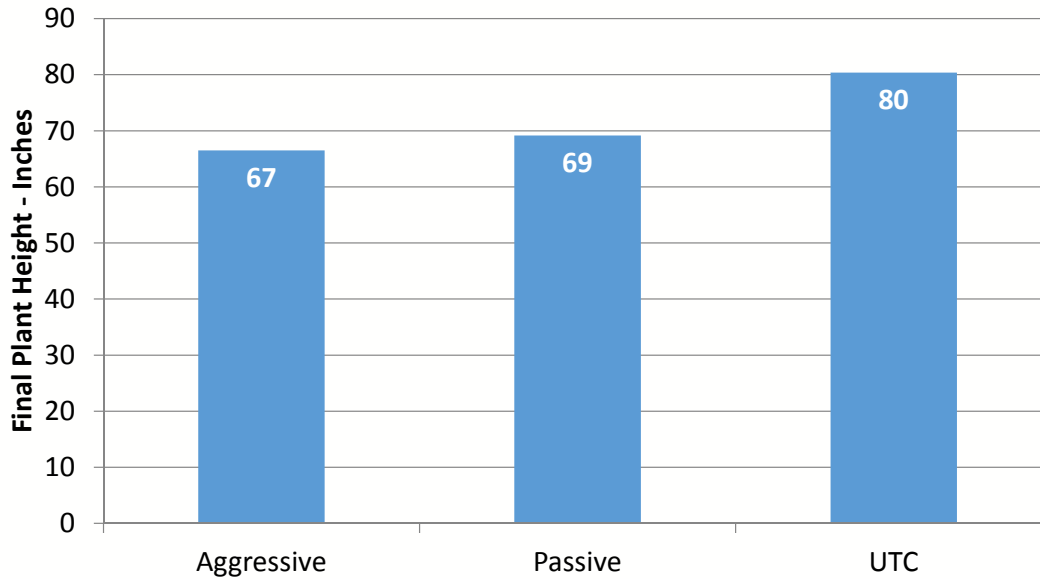
| Regime | Date | PGR Rate (ounces/acre) |
|------------|---------|------------------------|
| Aggressive | June 13 | 16 |
| | June 22 | 16 |
| | July 8 | 16 |
| Passive | June 27 | 12 |
| | July 8 | 16 |
| | July 14 | 20 |

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RESULTS & DISCUSSION

Figure 1. Average height of cotton plant by PGR regime.

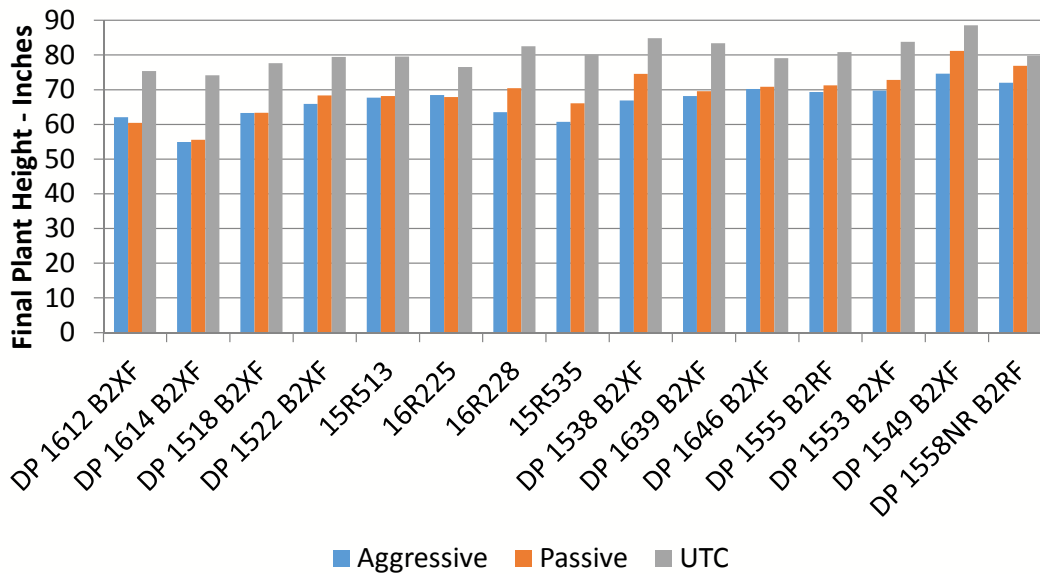


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RESULTS & DISCUSSION

Figure 2. Height of cotton plants by variety and PGR regime.*

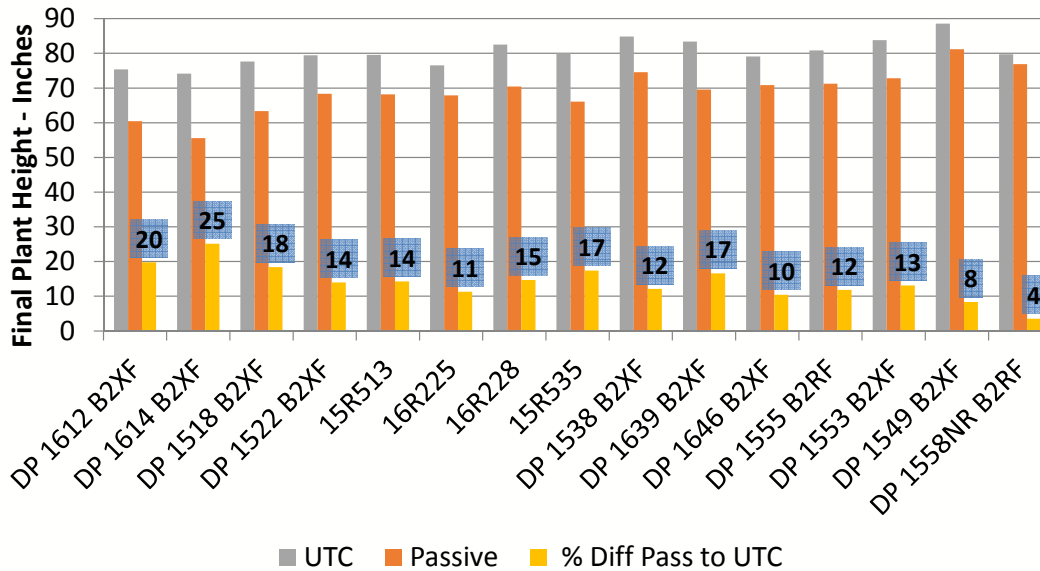


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RESULTS & DISCUSSION

Figure 3. Cotton height of passive PGR regime when compared to untreated check.*

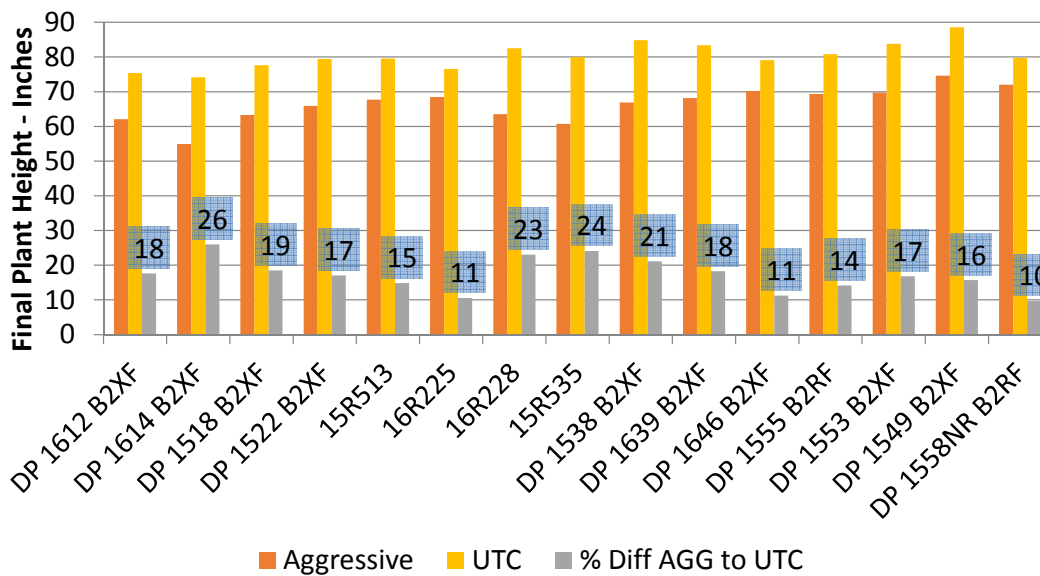


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Figure 4. Cotton height of aggressive PGR regime when compared to untreated check.*

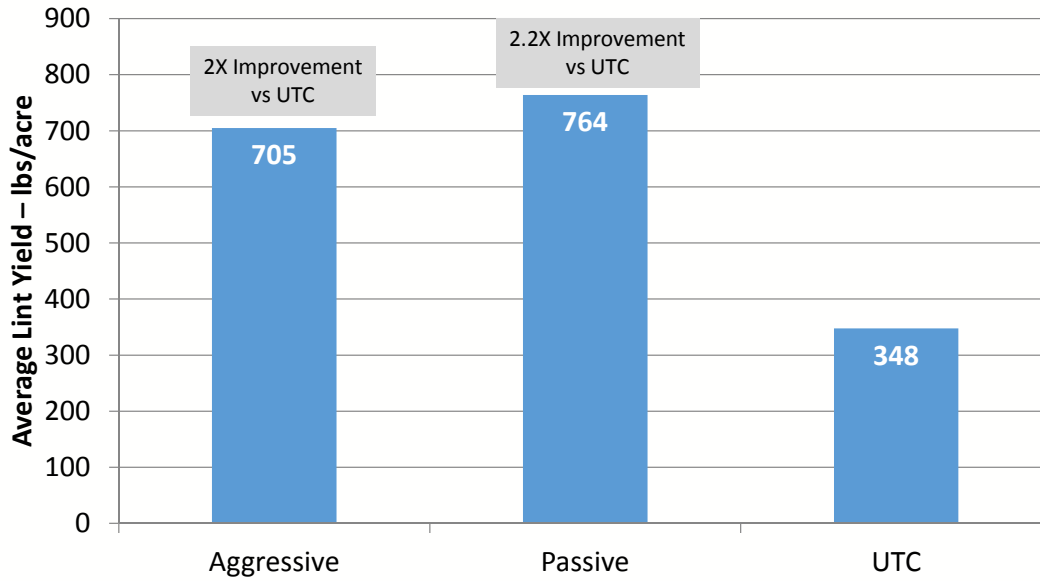


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RESULTS & DISCUSSION

Figure 5. Average cotton yield (lb lint/acre) by PGR regime.

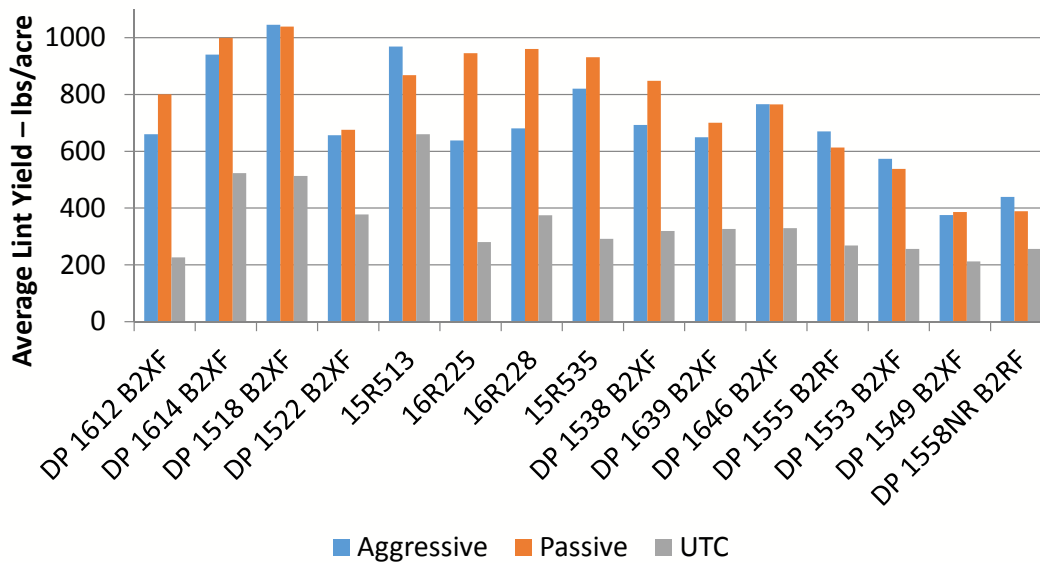


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RESULTS & DISCUSSION

Figure 6. Cotton yield (lb lint/acre) by variety and PGR regime.*

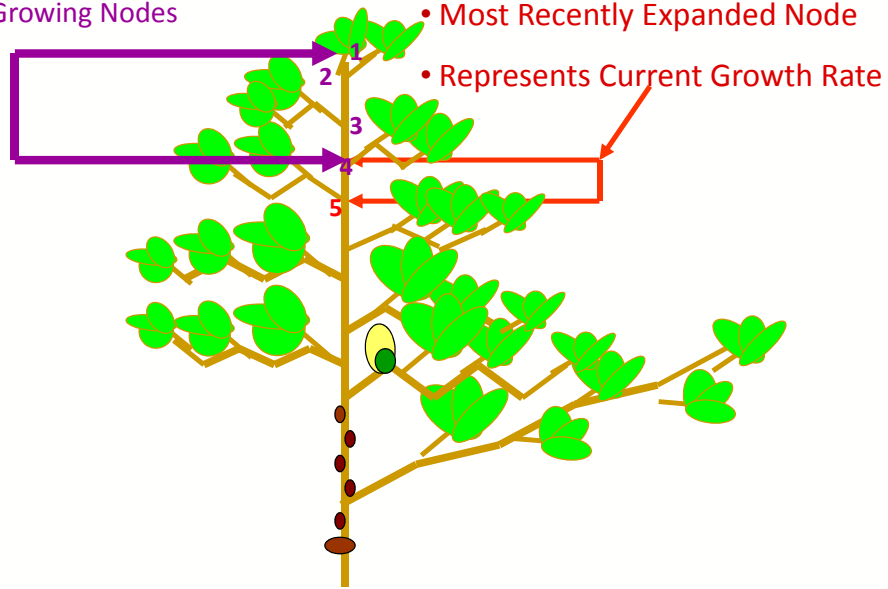


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RESULTS & DISCUSSION

Actively Growing Nodes



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RESULTS & DISCUSSION

PGR Monitoring and Management

TL size of a US quarter count as 1 to node 4



Node between 4 and 5 from the top – “The one that bends”



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RESULTS & DISCUSSION

Tools for Estimating PGR Application Rates and Timing

- Understand the plant growth process
- Mepiquat chloride is:
 - Not degraded by the plant
 - Active at ≈ 10 ppm dry wt.
- Response to mepiquat chloride over time
 - Rate
 - Timing
 - Plant size
 - Previous applications



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TAKE AWAYS

- The average height in the untreated plot with no PGR applied was 80.4 inches. This is indicative of extremely strong growth conditions (Figure 1).
- A range of responses in height reduction was recorded across the varieties tested (Figure 2).
- The best way to characterize varieties is by the percent reduction in height in the various PGR treatments (Figures 3 and 4).
 - Varieties with high amounts of height reduction are more sensitive to PGR applications and generally require less aggressive management.
 - They may also be less sensitive to stressful growing conditions (i.e. less determinate or more indeterminate). The inverse is also true for more determinate or less indeterminate varieties.

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TAKE AWAYS

- The range of responses in height reduction from aggressively managed plots was from 10 to 26 percent (Figure 4).
- The range of responses in yield was from 2.0 to 2.2X when comparing the PGR treated plots to the untreated control plots (Figures 5 and 6).
- This highlights the potential value of sound PGR management in producing cotton.
- All varieties should be managed responsively depending on how they are growing in each field on each farm.
- When making PGR application decisions for any cotton variety, remember to look at the node elongation of node 4 – 5 from the top of the plant, soil moisture, agronomic practices, and weather patterns.

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