The Response of Deltapine® Brand Cotton Varieties to Plant Growth Regulator Applications

Trial Objective

- This study was conducted to evaluate the yield characteristics and plant growth regulator (PGR) response of Deltapine® brand cotton varieties.
- It is important for growers to understand the growth characteristics of cotton varieties and their relative sensitivity to PGR applications. These studies at the Scott Learning Center help expand the available information about available products, including those with ThryvOn® Technology.
- Information on proper growth management for Deltapine® brand cotton varieties can help optimize the performance of new cotton varieties.

Research Site Details

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (lb/acre)	Seeding Rate (seeds/acre)
Scott, MS	Commerce/Forrestdale Silt Loam	Corn	Conventional	5/9/2023	9/29/2023	2000	42,000

- There were nine Deltapine® brand cotton varieties planted in this trial:
  - DP 2211 B3TXF
  - DP 2115 B3XF
  - DP 2317 B3TXF
  - DP 2127 B3XF
  - DP 2328 B3TXF
  - DP 2131 B3TXF
  - DP 2333 B3XF
  - DP 2038 B3XF
  - DP 2239 B3XF
- Plant growth regulator treatments included:
  - » Untreated control (UTC)
  - » Aggressive (AGG) PGR management with 4.2% mepiquat applied at the following timing:
    - 6/20/2023: 16 fl oz/acre at 7 nodes
    - 7/6/2023: 16 fl oz/acre at 12 nodes
    - 7/17/2023: 16 fl oz/acre at 15 nodes
- The trial was planted into a field with 140 lb nitrogen (N) surface applied as 30-0-0-2.5 prior to layby.
- Each treatment was planted as a 6-row strip trial with 0.17 to 0.21 acres per plot.
- All field work, tillage, and herbicide applications were per local standards.
- Data collected for this trial included:
  - » Nodes above white flower (NAWF) on 7/21/2023, collected from 10 plants per plot
  - » End of season plant heights, collected from 10 plants per plot
  - » Yield, machine harvested and collected from each plot
  - » Fiber collection for ginning, turnout, and fiber quality; 1 lb grab sample

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Understanding the Results

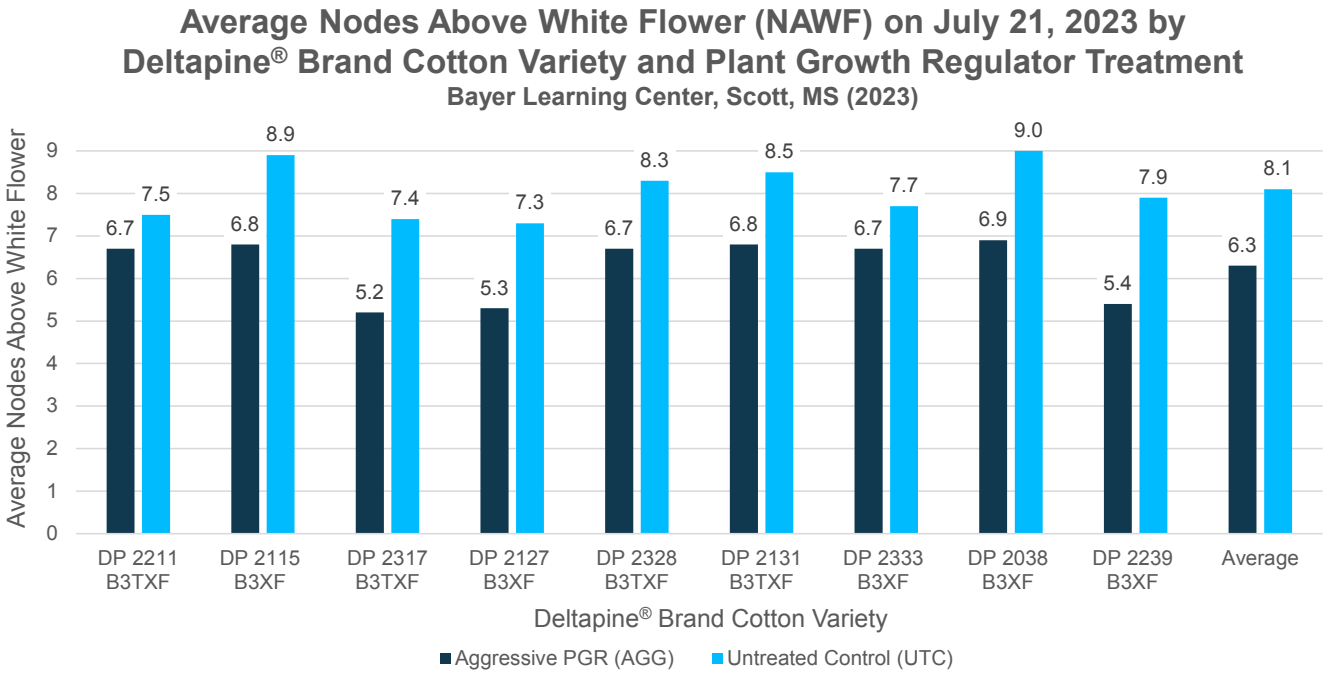

Figure 1. Average nodes above white flower by Deltapine® brand cotton variety tested and plant growth regulator treatment. Data recorded July 21, 2023 at the Bayer Learning Center at Scott, Mississippi (2023).

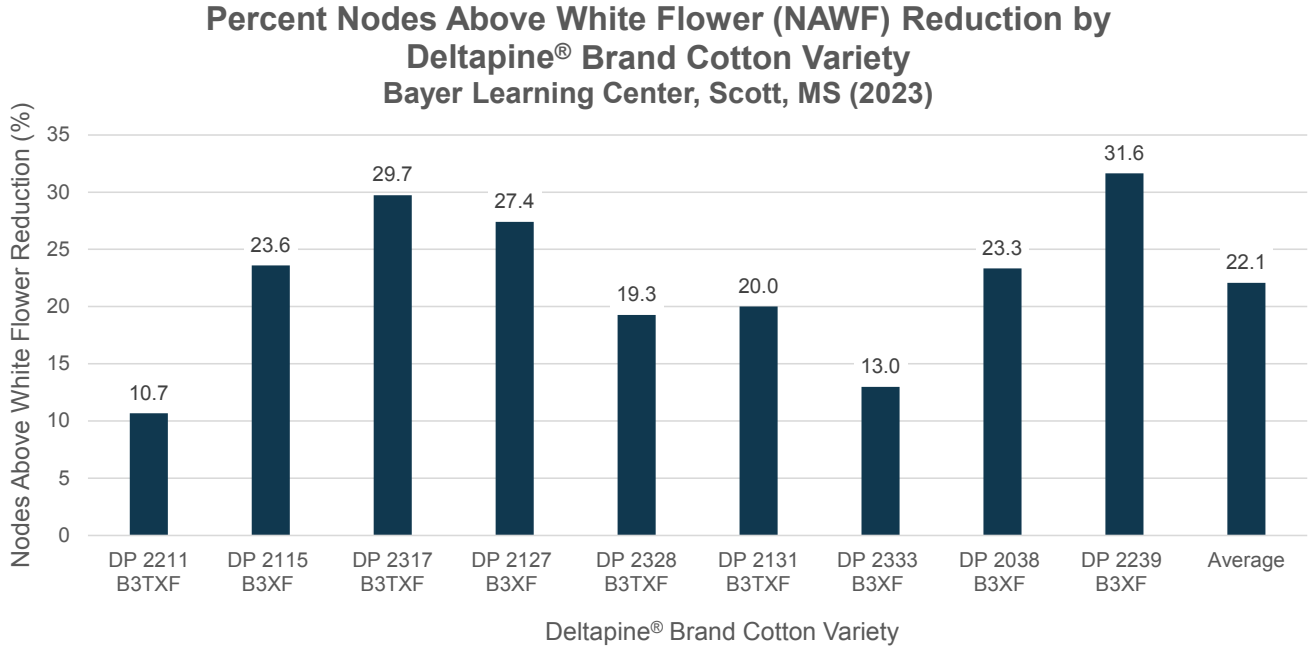

Figure 2. The percent reduction in nodes above white flower with an aggressive plant growth regulator treatment by Deltapine® brand cotton variety tested and plant growth regulator treatment. Data recorded July 21, 2023, at the Bayer Learning Center at Scott, Mississippi (2023).

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Nodes Above White Flower (NAWF)

- UTC NAWF (Figure 1)
  - Ranged from 9.0 to 7.3 across varieties tested
  - Average of 8.1 NAWF
- AGG NAWF (Figure 1)
  - Ranged from 6.9 to 5.2 across varieties tested
  - Average 6.3 NAWF
- This is an average reduction across of 1.75 nodes all varieties with AGG PGR management. This is an expected effect of PGR application and can be useful in evaluating the growth habit of cotton plants.
- Percent reduction in NAWF (Figure 2)
  - 22.1% average reduction across varieties tested
  - Reduction ranged from 31.6 to 10.7% across the range of tested varieties
- NAWF can be viewed as another measure of how well vegetative and reproductive growth are balanced and—in consideration with height reduction, yield results, and other growth habit characteristics—can be used to gauge potential responses to PGR applications through the season.
  - In most of the tested varieties NAWF was reduced between 20 to 30% by the three applications.
  - Several of the products appeared to stand out for various reasons including:
    - DP 2211 B3TXF was reduced the least (numerically) at 10.7%. It is understood to be a very determinate variety and does not require as much growth control as other varieties tested.
    - DP 2333 B3XF was reduced the second lowest amount at 13.0%, though it is not known to have a more determinate growth habit. This variety may be less sensitive to PGR applications. It showed the largest yield increase of the group from PGR applications.
    - DP 2239 B3XF showed a large decrease and likely needed growth control earlier, as it was quite sensitive to the applications when they were made. This is also reinforced by the final plant heights.
    - The remainder of the products demonstrated a somewhat normal range of responses.

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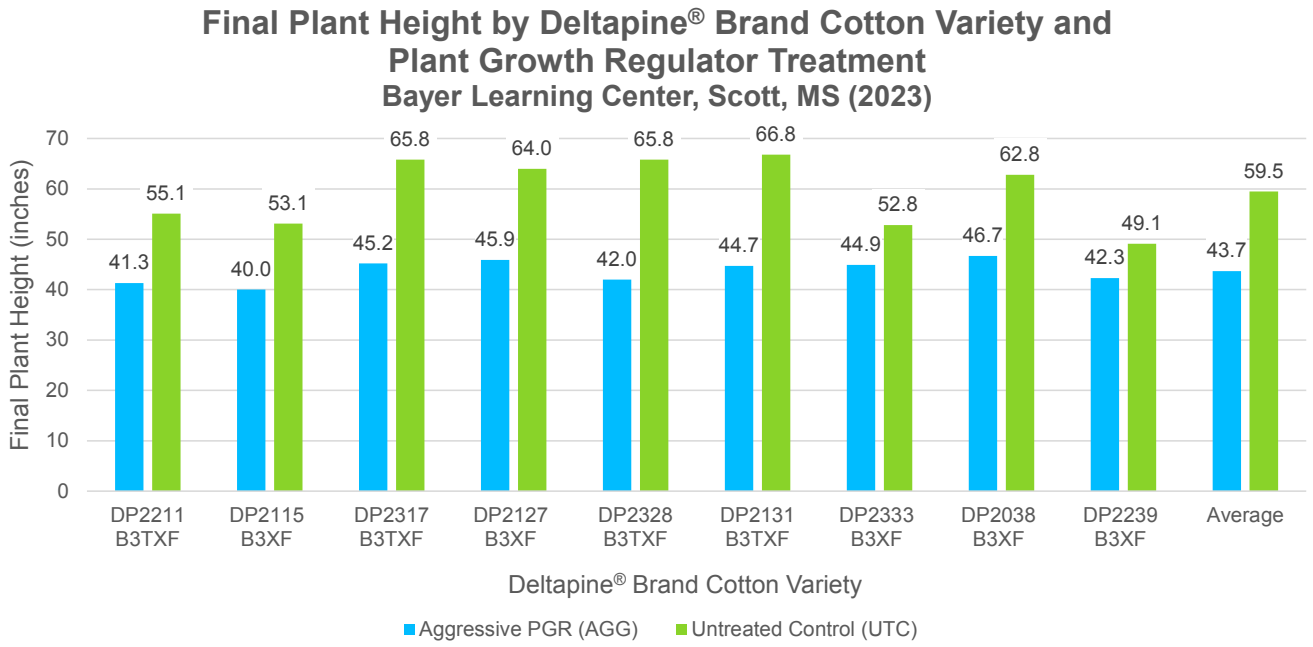

Figure 3. Final plant height by Deltapine® brand cotton variety and plant growth regulator treatment. The Bayer Learning Center at Scott, Mississippi (2023).

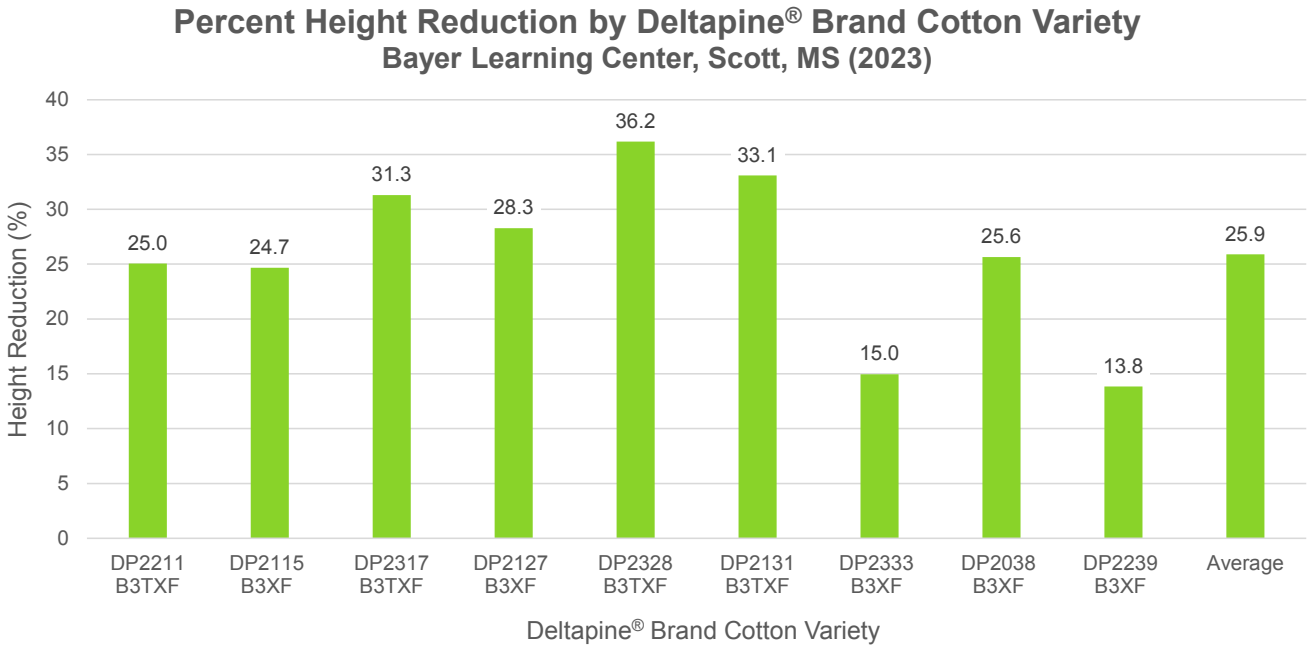

Figure 4. Percent height reduction of tested Deltapine® brand cotton varieties with the aggressive plant growth regulator treatment compared to the untreated control. The Bayer Learning Center at Scott, Mississippi (2023).

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Plant Heights

- Height reductions across this study were in the range that would be expected. Notable results include:
  - » End of Season Heights (Figure 3)
    - – UTC
      - Ranged from 66.8 to 49.1 inches tall
      - Average height: 59.48 inches
    - – AGG
      - Ranged from 40.0 to 46.7 inches tall
      - Average height: 43.67 inches
      - Average height difference compared to UTC: 15.81 inches shorter
  - » Percent Height Reduction (Figure 4)
    - – Average reduction: 25.9%
    - – Ranged from 13.5 to 36.2%
    - – Most of the tested products demonstrated a height reduction between 25 and 35%.
  - » Two obvious exceptions included:
    - – Data for DP 2239 B3XF (and possibly DP 2211 B3TXF and DP 2115 B3XF) indicated a lower height reduction percent, possibly due to a higher sensitivity to PGR applications and more controlled growth during the early vegetative growth phase.
    - – DP 2333 B3XF demonstrated a reduction similar to DP 2239 B3XF, but possibly for the opposite reason. This variety appears to truly be less sensitive to the applications.
    - – The remainder of the varieties showed moderate levels of sensitivity and, based on the data from this study, should be managed accordingly.

Yield Results (Figure 5)

- Average lint yield for UTC: 1372.5 lb/acre
- Average lint yield for AGG: 1563.2 lb/acre
- In this trial, the aggressively managed varieties had an average lint yield 190.7 lb/acre higher than the untreated varieties.
- Most varieties tested demonstrated a yield 100 and 200 lb/acre or 10 and 15% higher when managed aggressively with PGR applications over the untreated control.
- DP 2333 B3XF had the largest difference in yield of 426.7 lb/acre or 32.9% higher with the aggressive PGR application than the untreated control.

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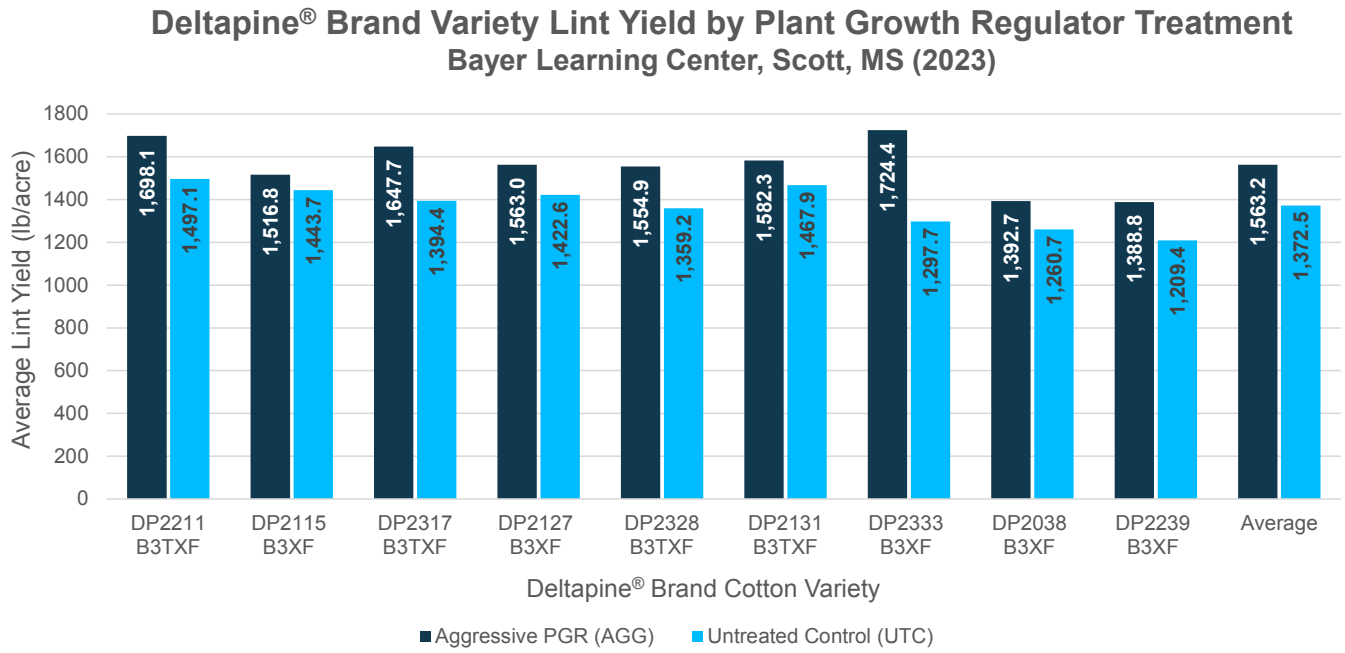

Figure 5. Deltapine® brand cotton variety lint yield by variety tested and plant growth regulator treatment. Bayer Learning Center, Scott, MS (2023).

Key Learnings

- The cotton varieties tested in this trial demonstrated a range of sensitivity to PGR application, and each product is different and must be managed accordingly.
- The varieties with higher sensitivity to PGR applications should require less aggressive management strategies and it is recommended to be planted in adequate soils with proper fertility.
- DP 2333 B3XF appears to be less growth-responsive to PGR management and highly yield responsive to intensive PGR management. For this reason, growers should carefully plan and implement appropriate PGR strategies when planting this variety.
- Each field, farm, and scenario should be carefully evaluated before implementing any PGR strategy. This should include consideration of established plant population, fertility, rotational crops, current growth rate, and varietal response to PGR use.
- Please contact your local Deltapine® representative for more information.

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Legal Statements

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The recommendations in this material are based upon trial observations and feedback received from a limited number of growers and growing environments. These recommendations should be considered as one reference point and should not be substituted for the professional opinion of agronomists, entomologists or other relevant experts evaluating specific conditions.

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