

# Impact of mixing two varieties on yield, fiber quality and net returns in Georgia

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## Overview

Georgia is one of the top cotton producing states in the country, producing over a million acres annually at a crop value close to \$1 billion. Due to this, it is imperative to assess varietal performance of cotton as new varieties emerge rapidly. Every year the UGA Cotton Team conducts on-farm trials to assess these varieties. One of the more consistently high yielding and widely planted varieties has been DP 1646 B2XF. Recently, there has been increased grower interest in seeing how this high yielding variety would do when mixed with one of the newer Deltapine® releases, DP 2038 B3XF. This interest stems from the thought that a high quality premium from DP 1646 B2XF would mix well with the high yielding DP 2038 B3XF. Additionally, it is thought DP 2038 B3XF would help mitigate losses from DP 1646 B2XF lodging. Our goal in this research was to assess these two varieties mixed together at six different locations across the South Georgia cotton belt.



Fig. 1 Image of the Deltapine 1646 B2XF and Deltapine 2038 B3XF seed mixture within the seed hopper prior to planting in Moultrie, GA.



Fig. 2 Harvest of the test plot at the Allentown, GA location.

## Materials & Methods

- Trials were planted at six on-farm locations: three in Moultrie, GA, one in Enigma, GA, one in Allentown, GA, and one in Statesboro, GA. Due to delayed harvest in two locations, only four will be presented.
- In all locations, DP 1646 B2XF, DP 2038 B3XF and a DP 1646 B2XF/DP 2038 B3XF mix were planted. The mix was made by taking an equal amount of each seed and mixing them together in each seed hopper (Fig. 1). In Enigma and Statesboro, these same three treatments were planted along with the varieties in the UGA Cotton OFVT to compare yield and quality to other standard commercial varieties.
- All trials were replicated 3 times at each location and planted in a randomized complete block design (RCBD).
- Seed cotton weight was collected at harvest and cotton samples were collected and ginned at the UGA Microgin in Tifton, GA. Lint turnout from the samples was used to generate lint yield.
- Samples were taken to the classing office in Memphis, TN to determine the impact of these treatments on fiber quality.
- Data was analyzed using Tukey's HSD in JMP statistical software. Yield, staple length, uniformity, lint turnout and loan value were compared by combining the results from all four locations. Yield data at the Enigma location was also compared to the other varieties in the 2021 UGA Cotton OFVT protocol.

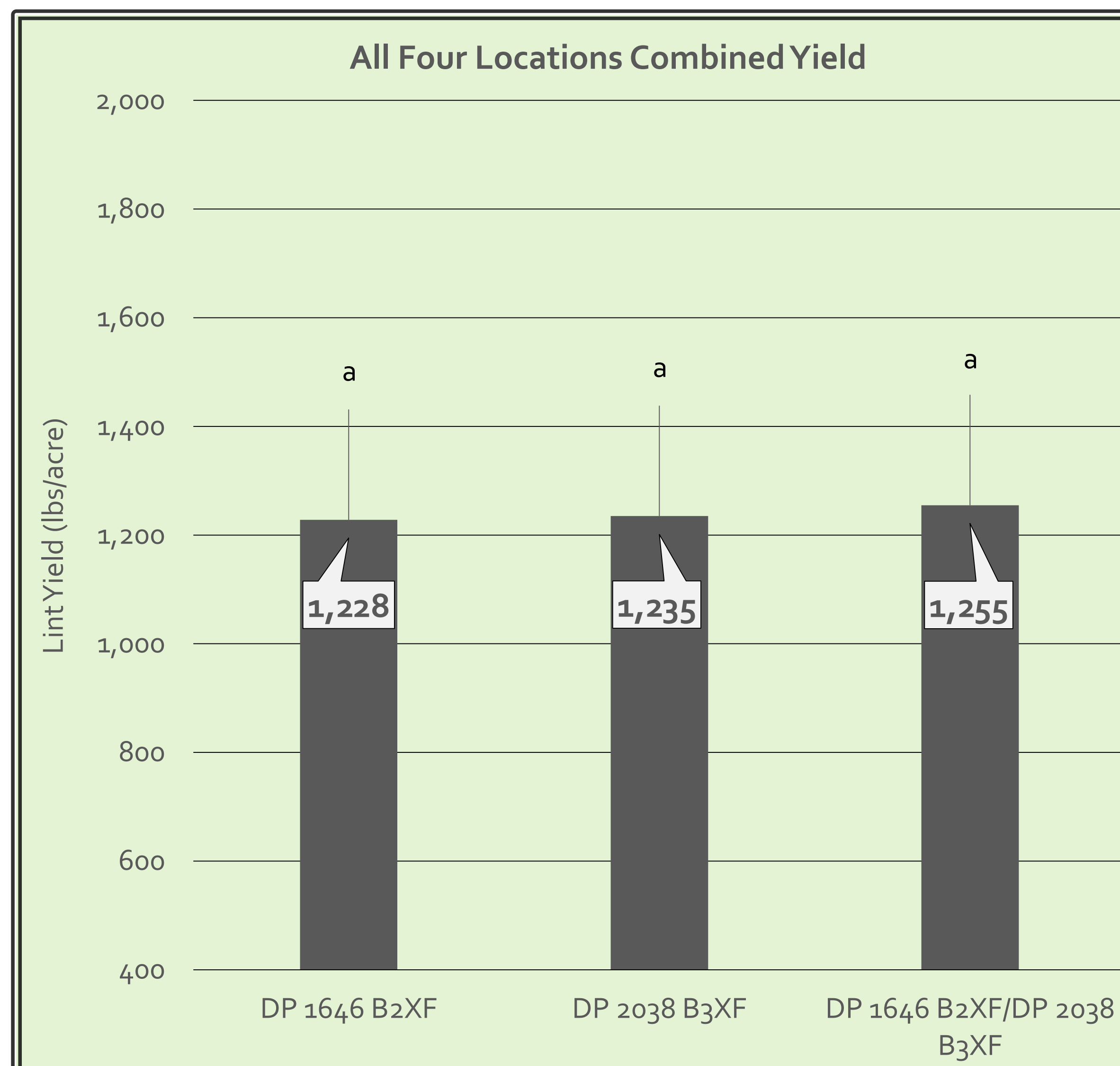


Fig. 3 Combined yield results from all four locations. Data was analyzed using a Tukey's HSD in JMP statistical software ( $p < 0.05$ ). Different lower case letters indicate significant differences.

	Lint Turnout (%)	Staple Length (in.)	Uniformity (%)	Loan Value (¢/lb.)	Loan Value (\$/acre)
DP 1646 B2XF	40 <sup>b</sup>	1.19 <sup>a</sup>	82.4 <sup>a</sup>	55.64 <sup>a</sup>	685.85 <sup>a</sup>
DP 2038 B3XF	42.1 <sup>a</sup>	1.11 <sup>c</sup>	81.1 <sup>b</sup>	54.21 <sup>b</sup>	678.25 <sup>a</sup>
DP 1646 B2XF & DP 2038 B3XF	41.4 <sup>a</sup>	1.16 <sup>b</sup>	81.6 <sup>ab</sup>	55.36 <sup>a</sup>	698.09 <sup>a</sup>

Fig. 4 Combined lint turnout, staple length, uniformity and loan value results from all four locations. Samples were taken from the field and ginned at the UGA Microgin in Tifton, GA. Following this, lint was taken to the classing office in Memphis, TN. Data was analyzed using a Tukey's HSD in JMP statistical software ( $p < 0.05$ ). Different lower case letters indicate significant differences.

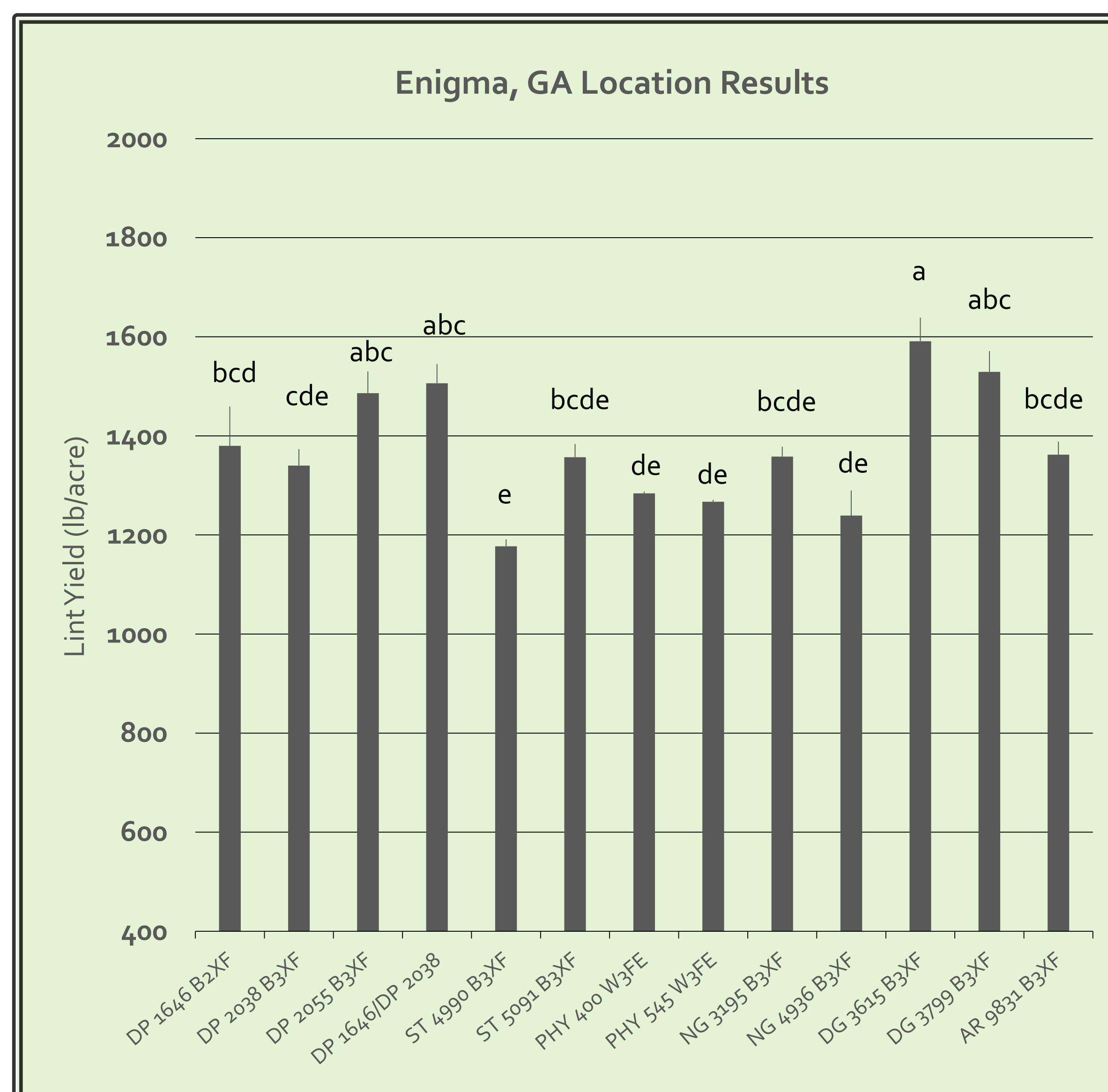


Fig. 5 Yield results from the test plot in Enigma, Ga. The Deltapine® 1646/2038 seed mixture was added to the UGA Cotton OFVT protocol and compared to all varieties. Data was analyzed using Tukey's HSD in JMP statistical software ( $p < 0.05$ ). Different lower case letters indicate significant differences.

## Results

- There were no significant differences in yield between the three treatments combined across the 4 locations (Fig. 3). Yields were 1,228, 1,235 and 1,255 lbs/acre for DP 1646 B2XF, DP 2038 B3XF and the two varieties mixed, respectively (Fig. 3).
- In Enigma, GA the DP 1646 B2XF/DP 2038 B3XF mix yielded higher than the 4 location average. However, it was not significantly different than DP 1646 B2XF nor DP 2038 B3XF (Fig. 5). Additionally, the yield from the mix had a significantly higher yield than 4 out of 12 varieties in the trial, but it was similar to eight other commercially available varieties (Fig. 5).
- The DP 2038 B3XF and DP 1646 B2XF/DP 2038 B3XF mix lint turnouts were statistically similar and both were significantly higher than DP 1646 B2XF (Fig. 4).
- Staple length was statistically highest in DP 1646 B2XF followed by the DP 1646 B2XF/DP 2038 B3XF mix, and DP 2038 B3XF, respectively (Fig. 4).
- The uniformity was higher in DP 1646 B2XF compared to DP 2038 B3XF, however neither were statistically different from the DP 1646 B2XF/DP 2038 B3XF mix (Fig. 4).
- The loan value for DP 1646 B2XF and DP 1646 B2XF/DP 2038 B3XF were statistically similar and significantly higher than DP 2038 B3XF on a per pound basis, but extrapolated to \$/acre, there were no significant differences in loan value (Fig. 4).

## Conclusions

These results indicate that while mixing DP 1646 B2XF and DP 2038 B3XF may seem advantageous, the economic return isn't justified. This is evidenced through yield, as mixing the two varieties did not provide a yield benefit at the four locations. Additionally, the results from the Enigma, GA location show that 8 of the 12 other tested varieties performed similarly, making the hassle of seed mixing hard to justify if looking for higher yield. In regards to quality, there were some differences in this data, but there were no significant differences in loan value per acre (Fig. 4). For example, lint turnout was higher in mixing compared to DP 1646 B2XF alone, but was the same as DP 2038 B3XF. Likewise, staple length was statistically average (Fig. 4). It is likely not a novel or uncommon concept to mix two seed with differing attributes together. However, at this time there is no benefit in mixing DP 1646 B2XF and DP 2038 B3XF together if looking for improved yield or quality.

## Acknowledgements

The UGA Cotton Team would like to thank the following for their cooperation in conducting this research: Tim McMillan, South Central Gin, Bart Davis, Craig Perryman, The Sunbelt Ag Expo, Funston Gin, David Hall, Wade Hodges, and Chandler Rowe as well as his staff at the UGA Microgin. Additionally we would like to thank the Georgia Cotton Commission, Cotton Incorporated, and our industry partners for their support of this research.



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