Planting Pattern and Seeding Rate Effects on Yield, Fiber Quality, and Boll Distribution

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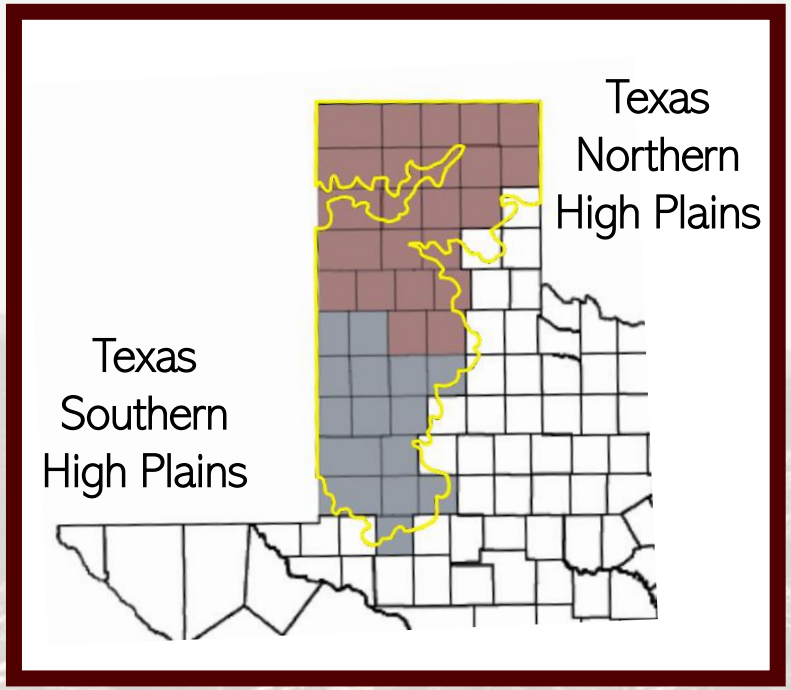
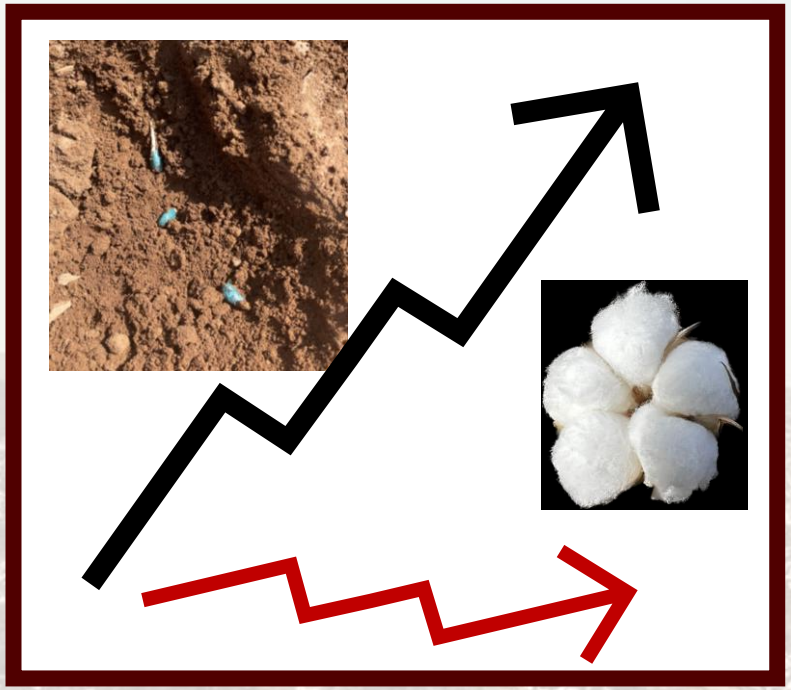
Background



Decreasing Irrigation Capabilities



Increasing Input Costs
Stagnant Commodity Prices

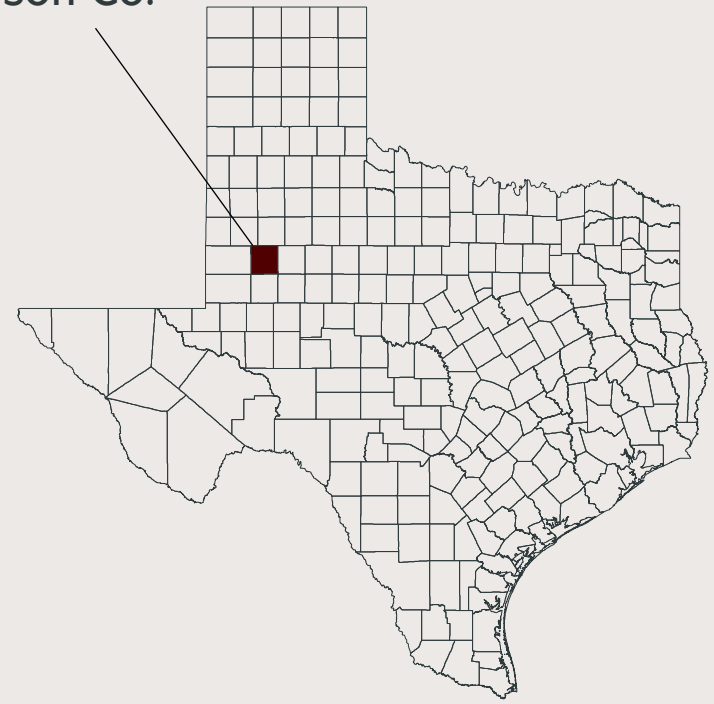
Erratic Weather Patterns

Objective

Determine if varying row spacing and seeding densities impact cotton lint yield, fiber quality, and boll distribution.

Methodology

Dawson Co.



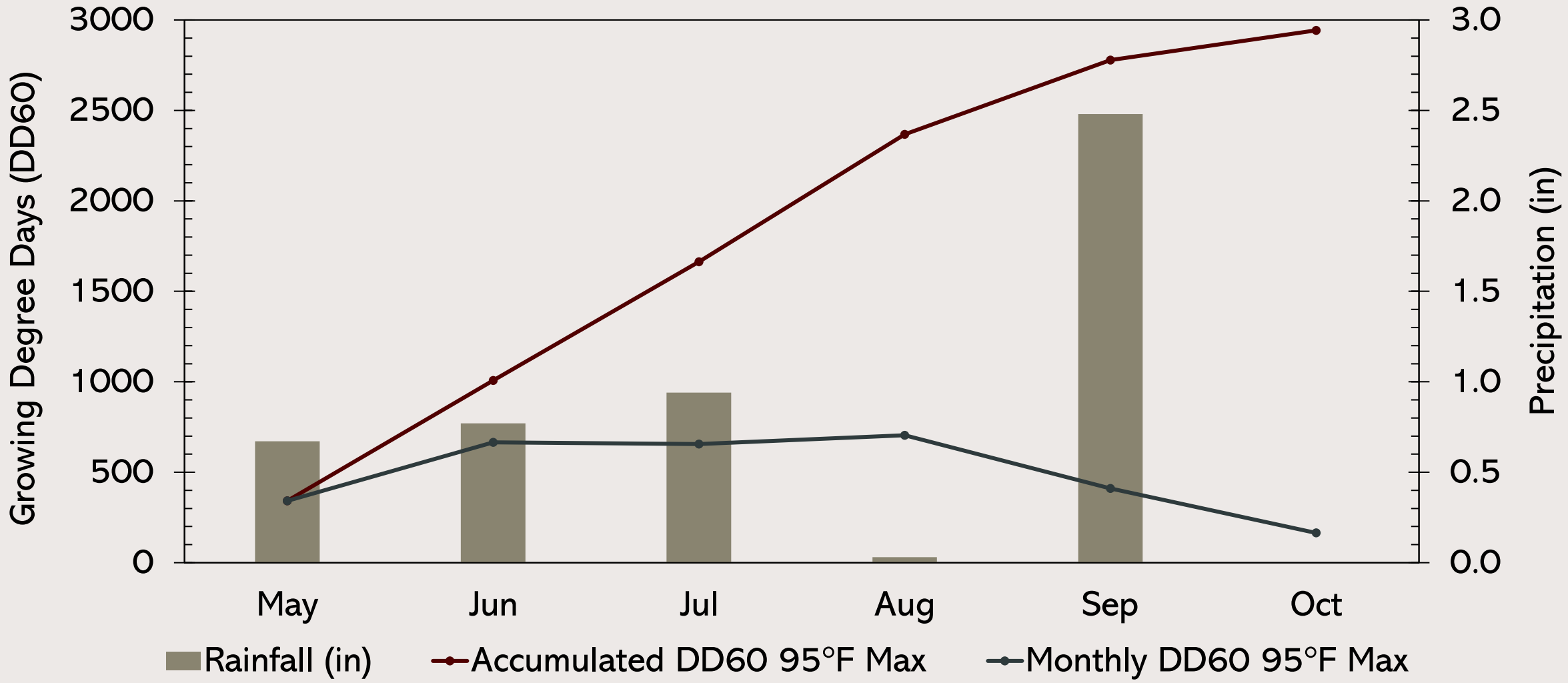
Research Site:

- AG-CARES, Dawson Co.
- **Row Spacing:**
  - 40 in
  - 80 in
- **Seeding Rate:**
  - 2 seeds/ft
  - 4 seeds/ft
- **Varieties:**
  - PHY205W3FE
  - PHY411W3FE
- Planting date: 5/09/24
- Harvest date: 10/14/24
- Subsurface drip irrigation
  - 1 in per week 6/20 – 8/30 (approximately 10 in total irrigation)

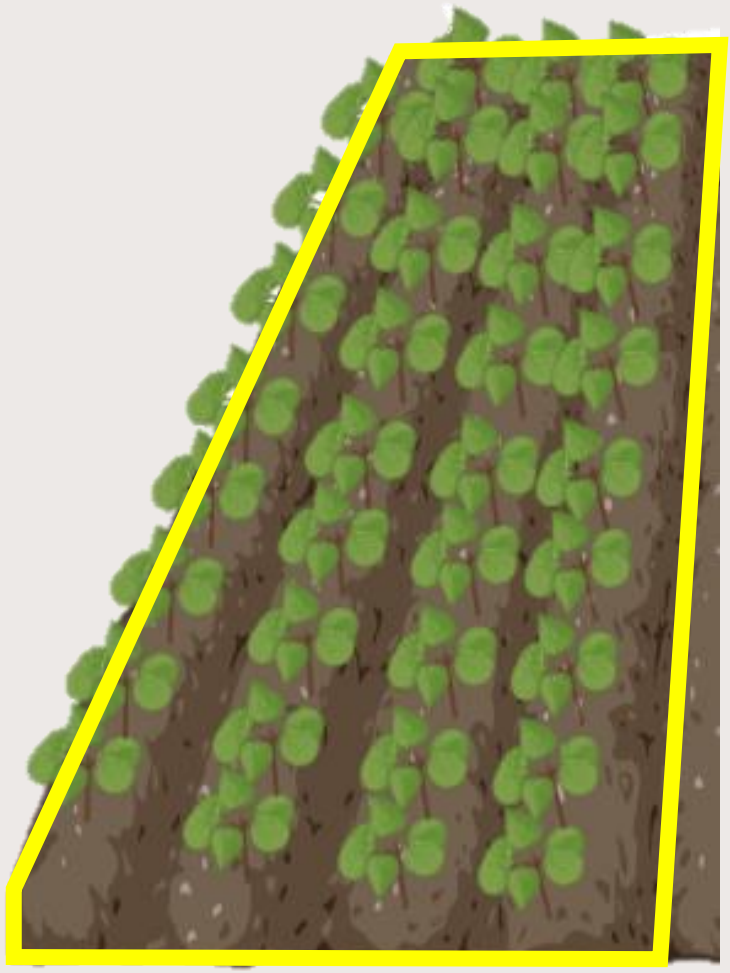
Statistical design and analysis:

- Randomized Complete Block Design
- 4 replications
- Significance was established using an Analysis of Variance (ANOVA) in JMP Pro 18, Fisher's LSD ($\alpha = 0.05$) was utilized for mean separation.

Weather

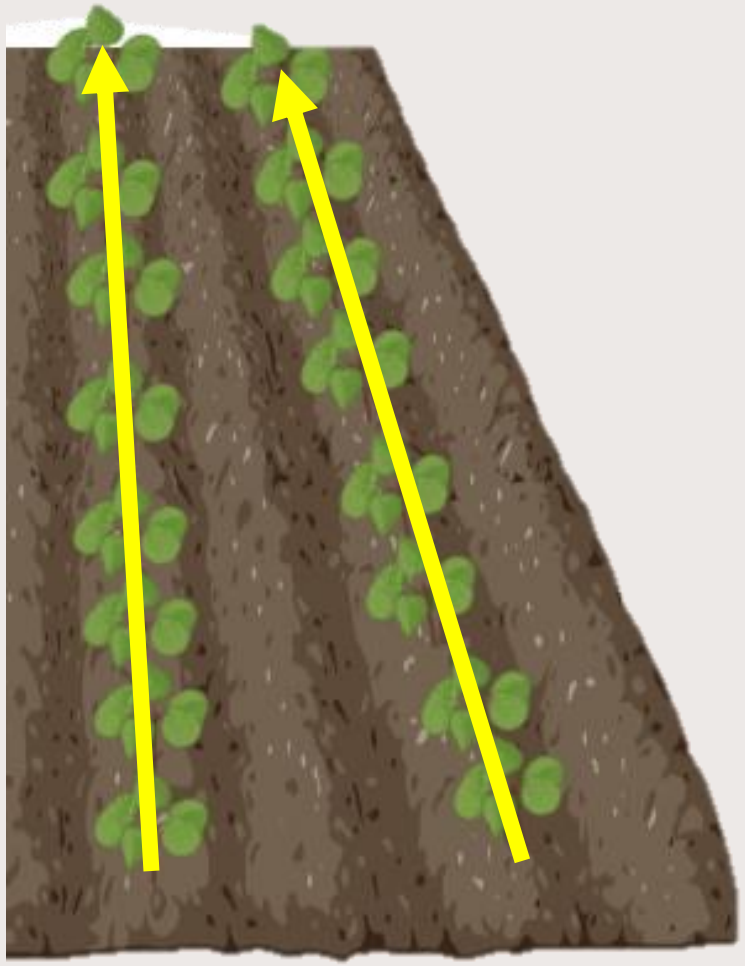

3000
2500
2000
1500
1000
500
0
Growing Degree Days (DD60)
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Precipitation (in)
May
Jun
Jul
Aug
Sep
Oct
Rainfall (in)
Accumulated DD60 95°F Max
Monthly DD60 95°F Max

Land vs Planted basis



Conventional

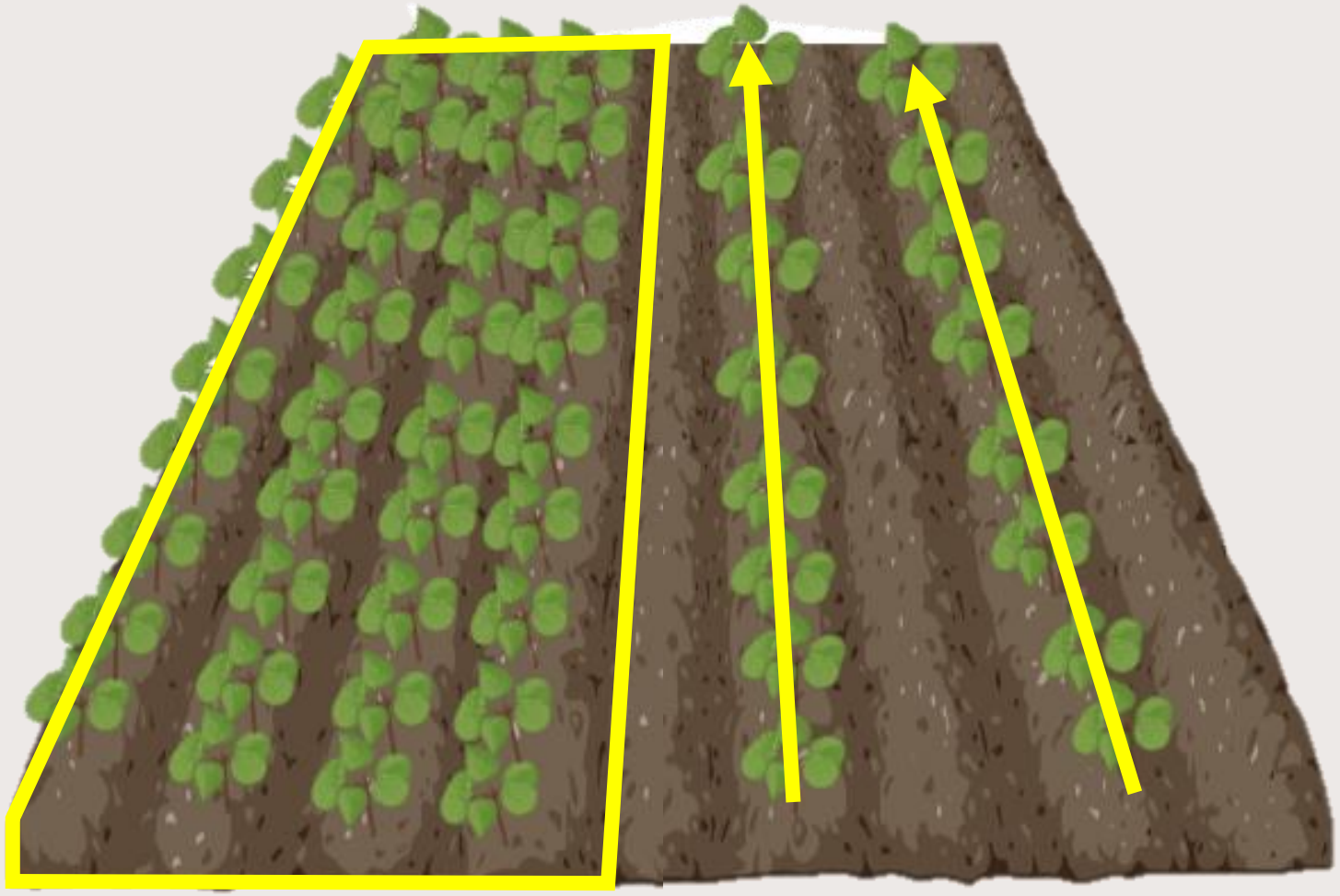
Land vs Planted basis



Wide Row

Land vs Planted basis

Why does it matter?



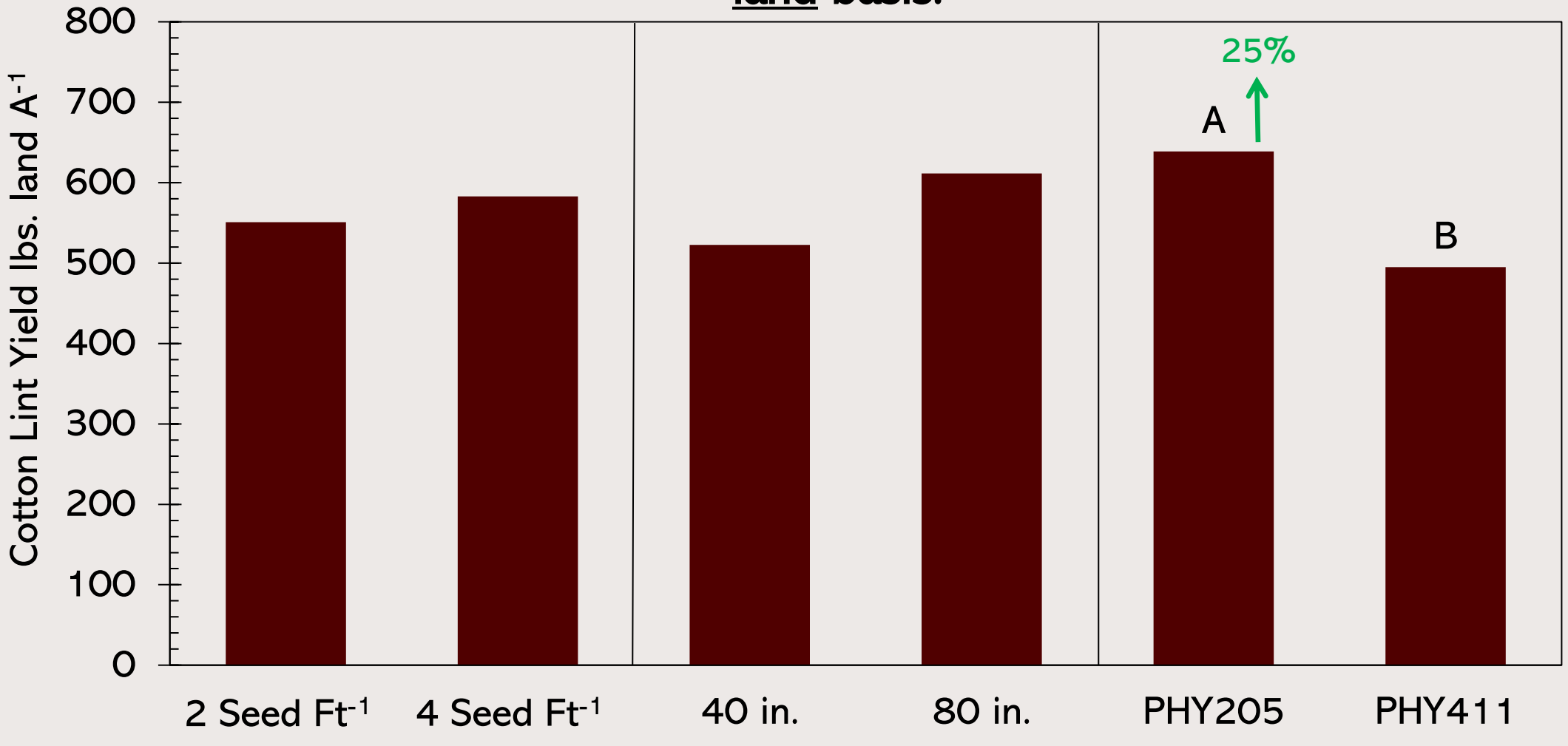
Conventional

Landowners
Lending Agencies

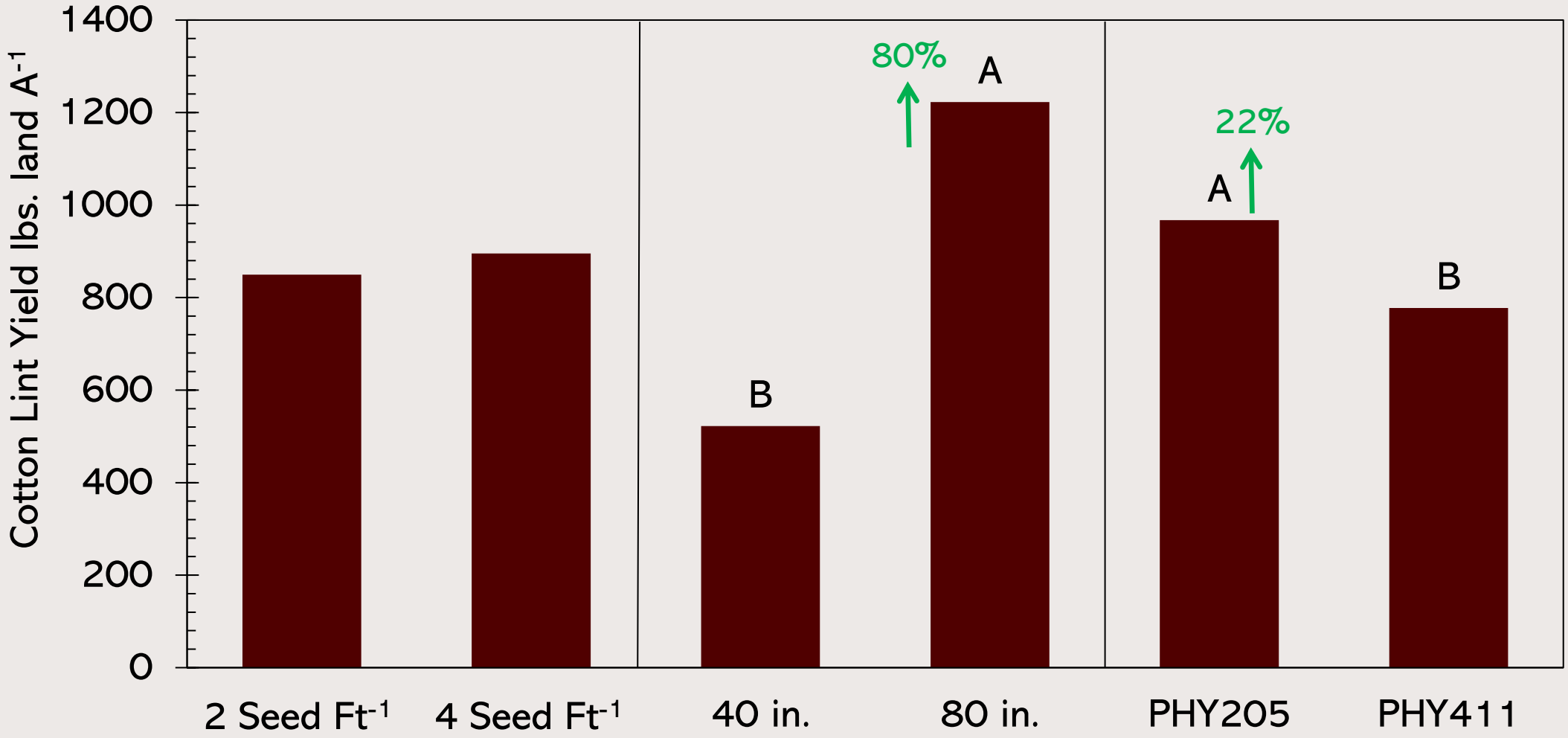
Wide Row

Growers
Crop Insurance Agencies
FSA

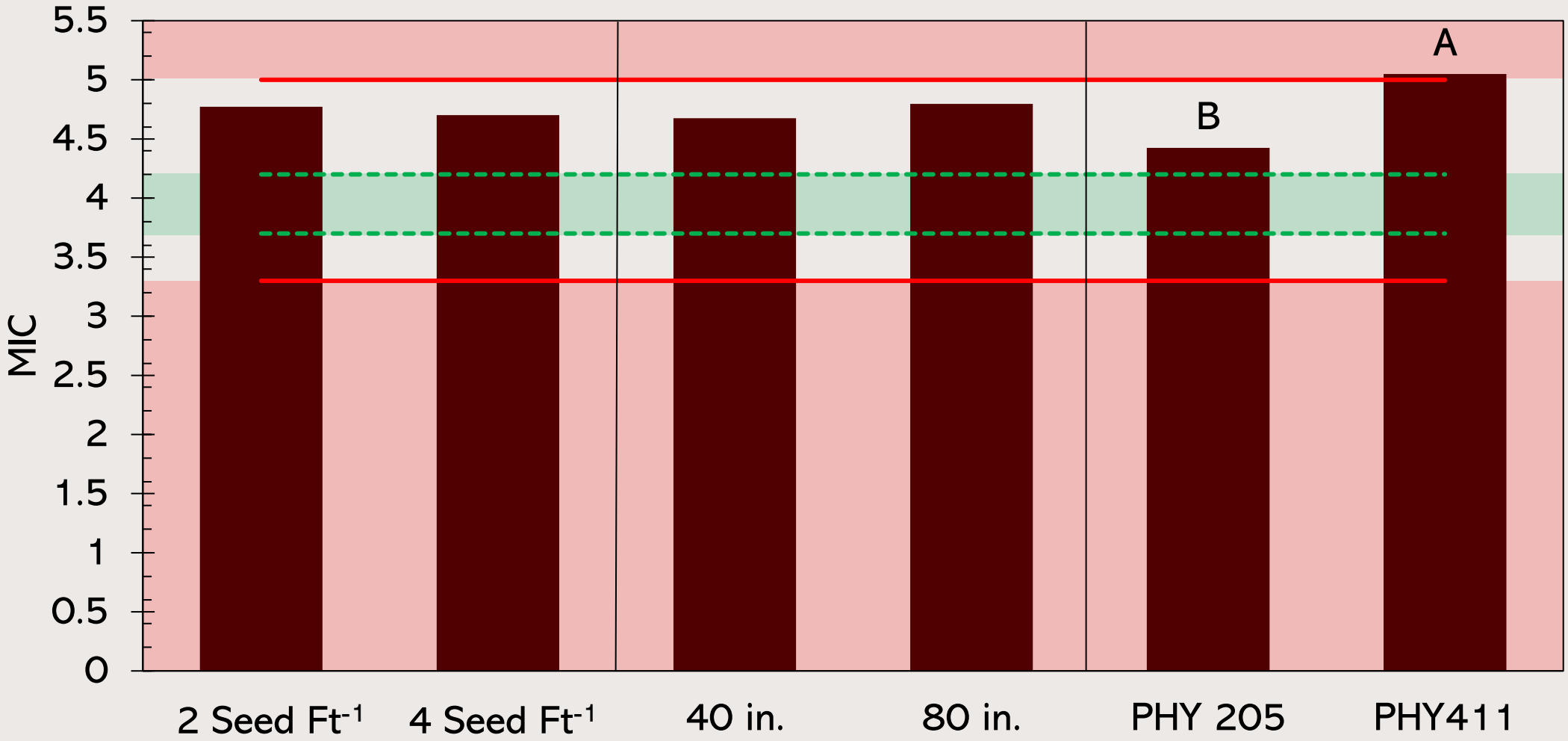
More determinate varieties increased cotton lint yields 25% on a land basis.



Planted cotton lint yields averaged 51% higher with wider row spacing and more determinate varsities.

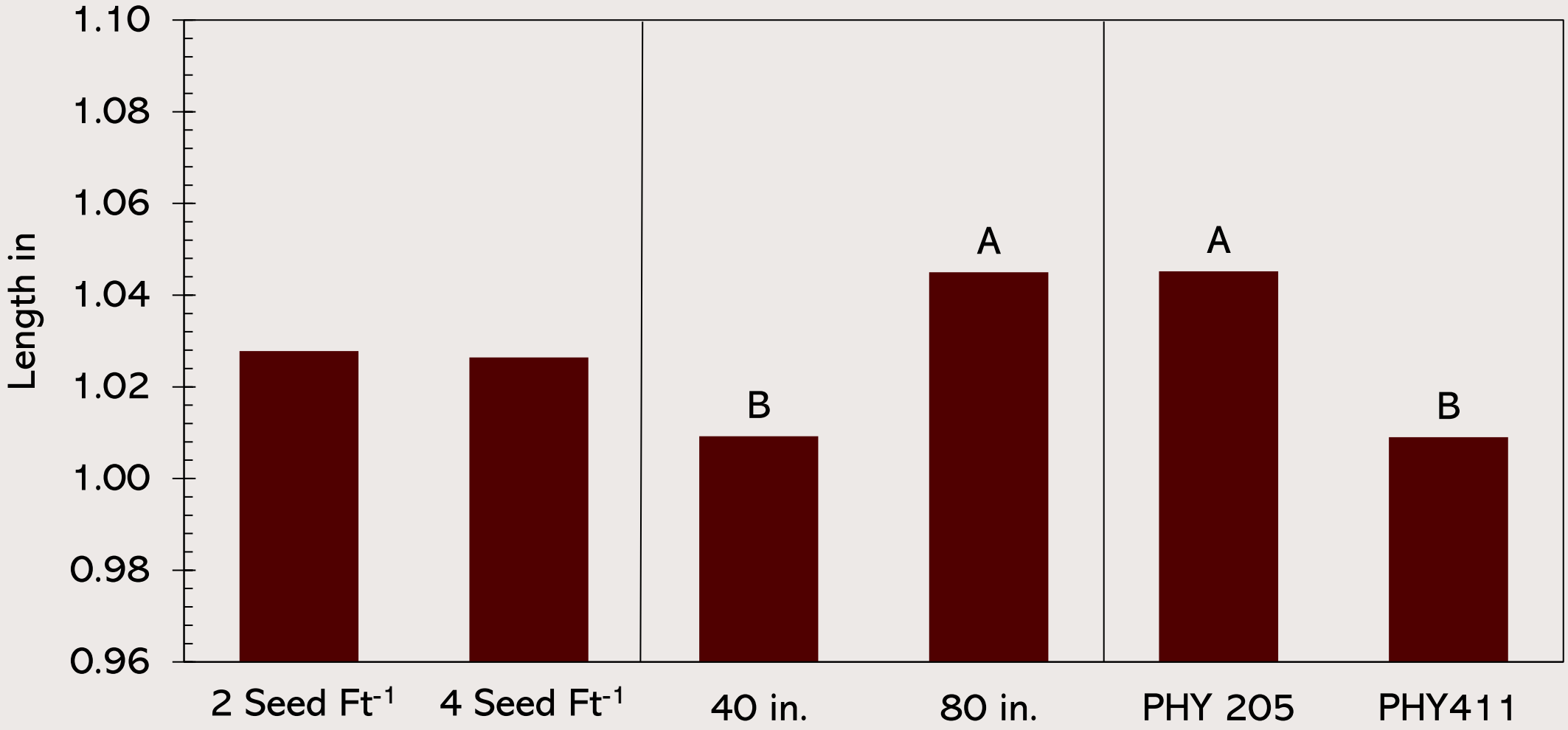


The more determinant variety significantly decreased Micronaire.



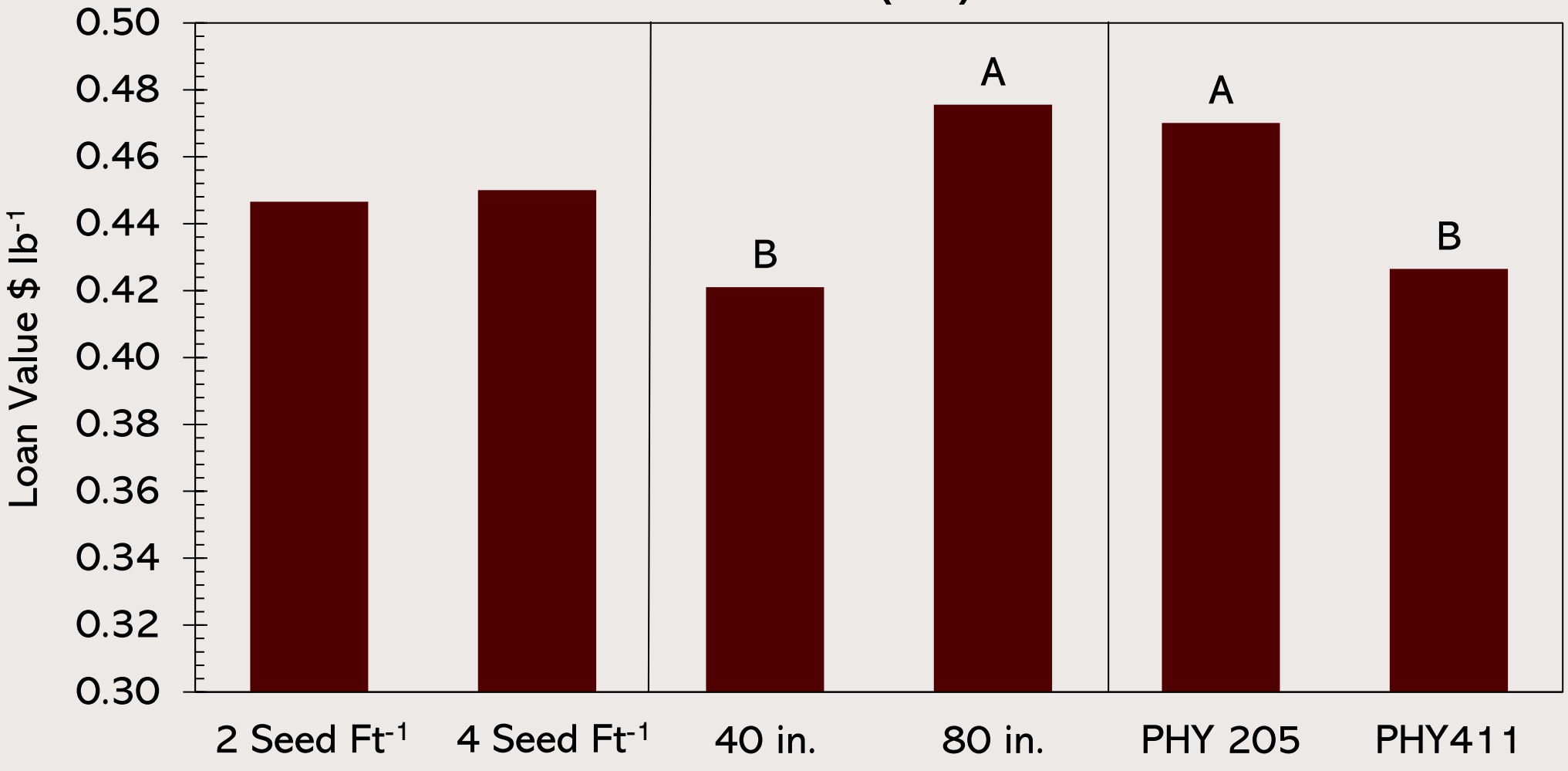
Length (in.)

The wider row spacing and more determinate variety significantly increased length (in).

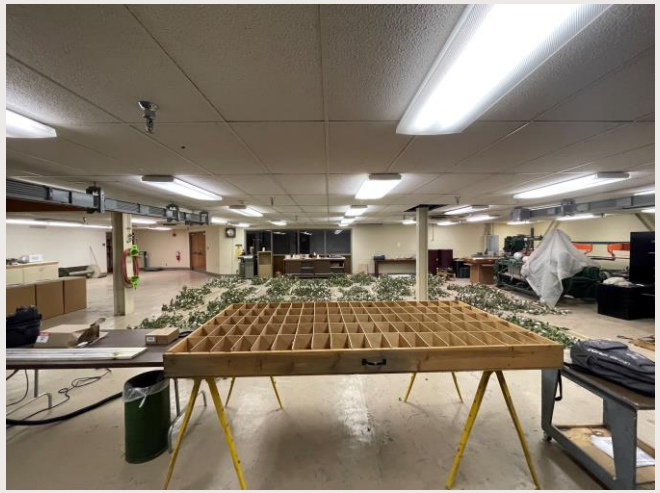


Loan Value ($/lb.)

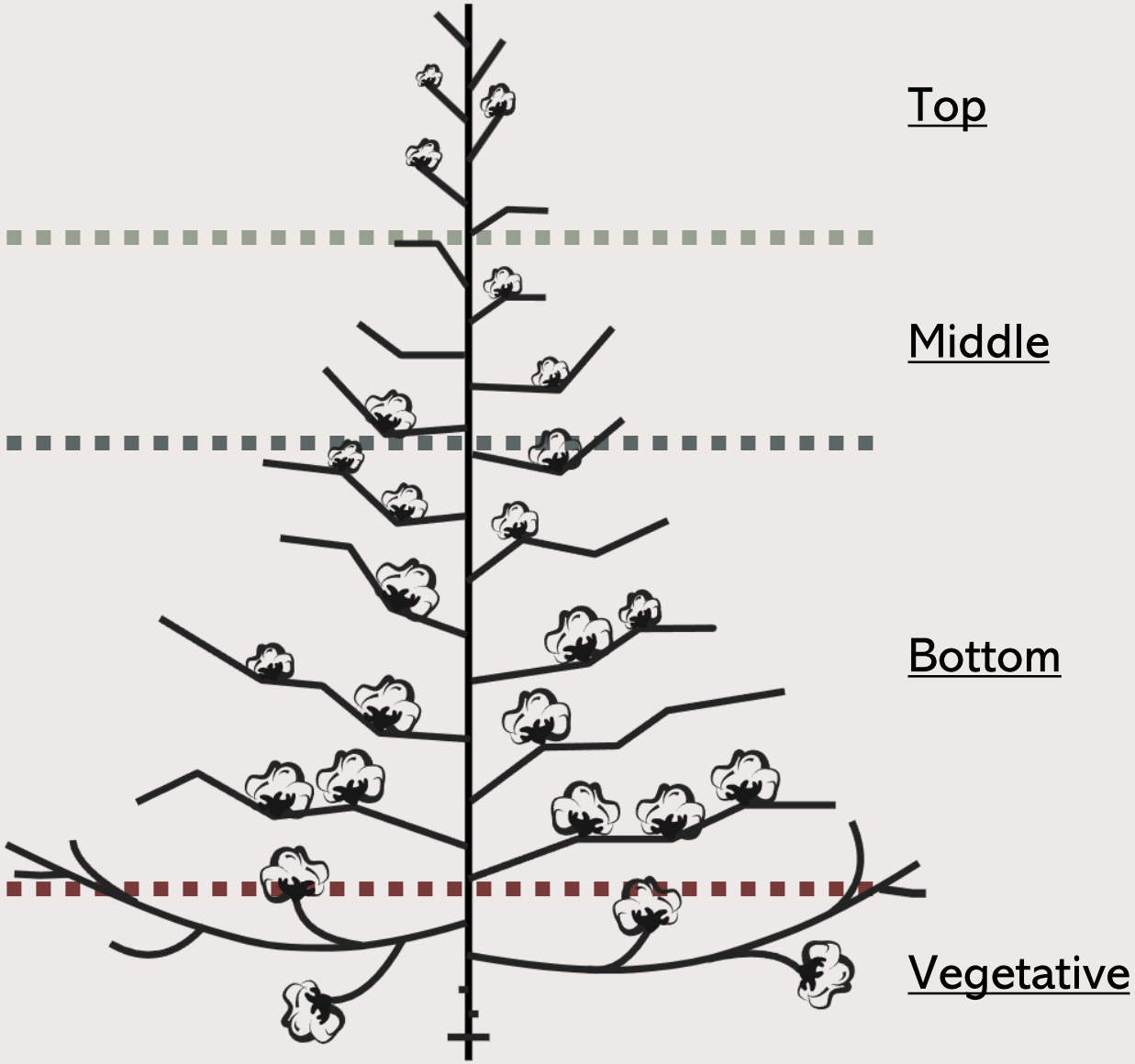
The wider row spacing and more determinate variety significantly increased loan value ($/lb).



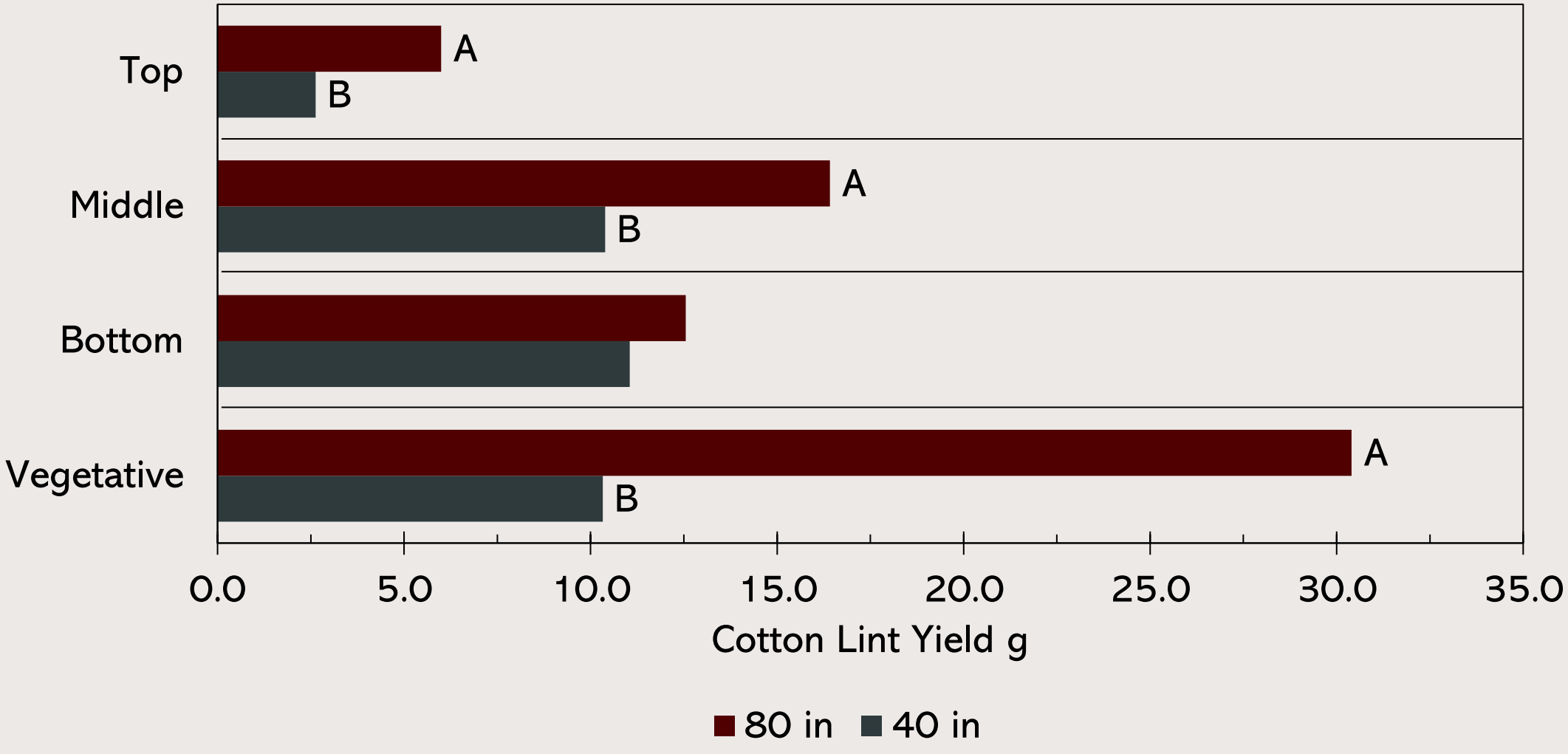
Methodology

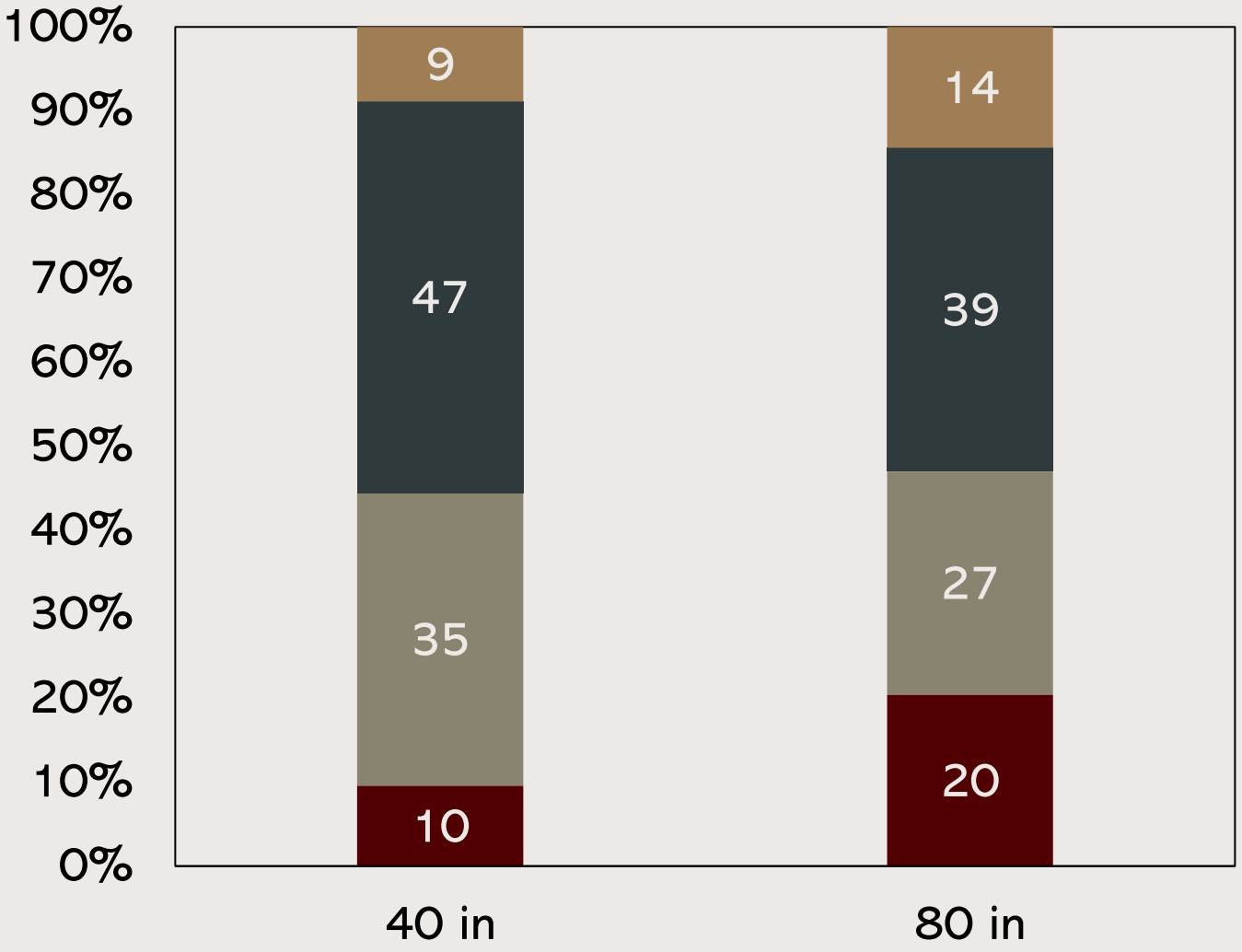


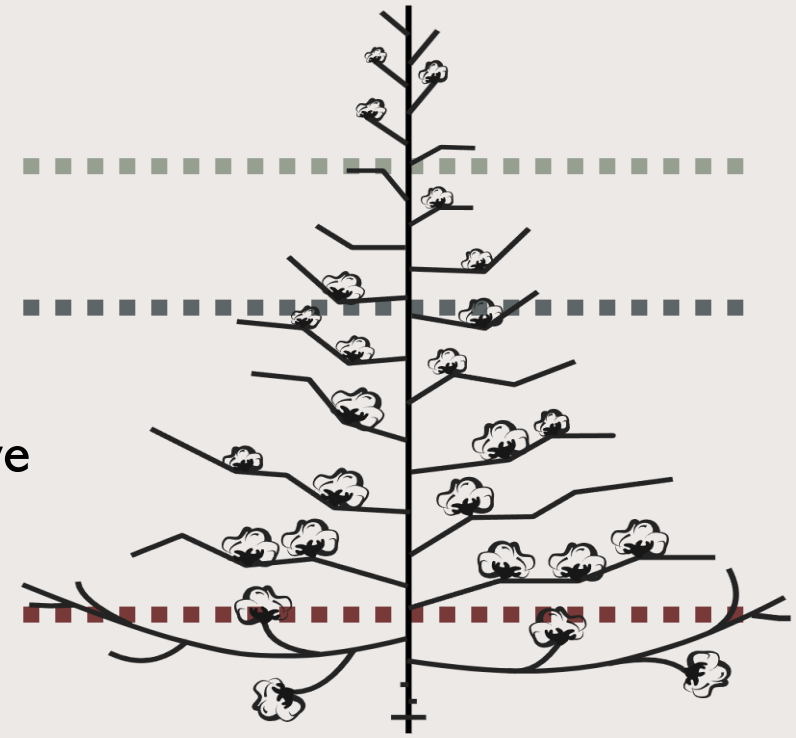
Methodology



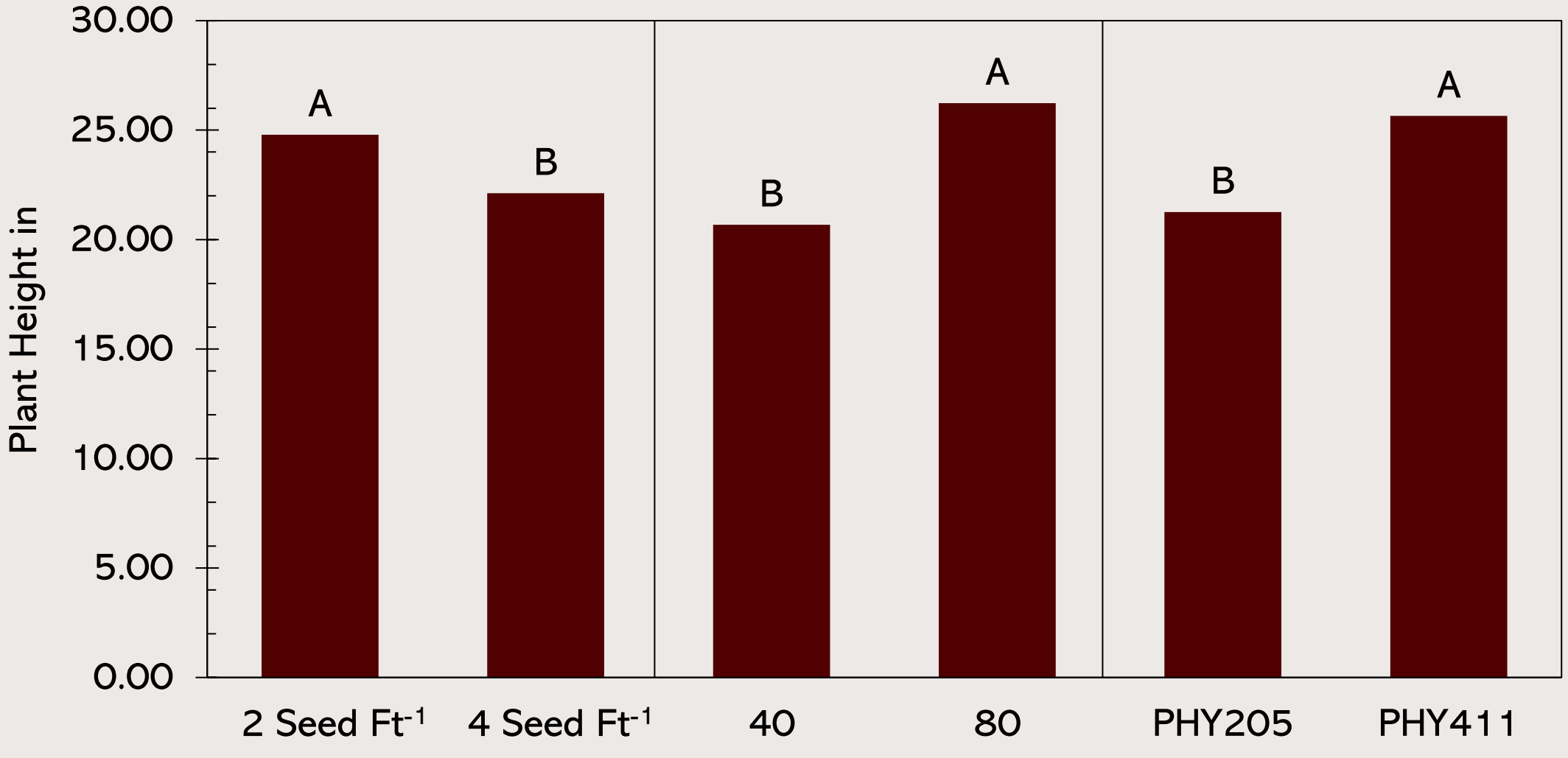
Vegetative, Middle, and Top portions of the plant were significantly larger at wider row spacings.




100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
9
47
35
10
14
39
27
20
40 in
80 in
Top
Middle
Bottom
Vegetative



Decreased seeding rates, wider row spacings, and a more indeterminate variety significantly increased plant height.

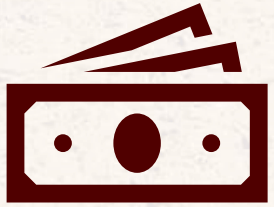


Conclusion

Objective: Determine if varying row spacing and seeding densities impact cotton lint yield, fiber quality, and boll distribution.

2024 Preliminary results - multiple years are required to better determine the impact of row spacing and seeding rates on lint yield, fiber quality, and boll distribution.

Wider row spacing increased yield on a planted basis.



Wider row spacing increased length and loan value.

Wider row spacing increased vegetative weight and plant height.

Special thanks to Dr. Legé, Dr. Kelly, Dr. Shumate, Abiye, and Mehedi!

Thank you!

Cotton Incorporated

Texas State Support Committee

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PLAINS COTTON IMPROVEMENT PROGRAM

Texas Fiber Initiative

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