Case Study

Accelerate™ Rates and Timing in Cotton

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This case study examines results from a field trial that tested various rates of AEA's nutritional product Accelerate™ when applied to cotton at three stages of growth, on an otherwise conventional management program. The goal was to determine the rate and timing of an Accelerate™ application to deliver the most return on investment.

Key Achievements:

- All 13 trial variations delivered a **yield increase** over the control
- Earlier applications–at the pinhead square stage–gave the most ROI: up to 11.5x
- Product costs as low as $6.40 per acre delivered a 10x ROI, showing the potential of Accelerate™ to be **a very cost-effective option** for cotton growers to improve profitability, even with no other changes to their management practices

Accelerate™ is one of AEA's flagship products. It provides a wide range of nutrients needed by plants during blossoming, and can increase the number of flowers, improve fruit set, and encourage plants to move from a vegetative to reproductive phase of growth. We've long known the power of Accelerate™ to produce an exceptional bloom on cotton. One AEA grower comments that Accelerate™ turns his cotton fields into "a sea of white." The purpose of this trial was to dial in the rate and timing of an Accelerate™ application to provide the most return on investment for the grower.

Trial Design

The trial took place at a conventional cotton farm in Lubbock, Texas. Aside from Accelerate™ applications, no changes were made to the grower's standard program of fertilizer and pesticide.

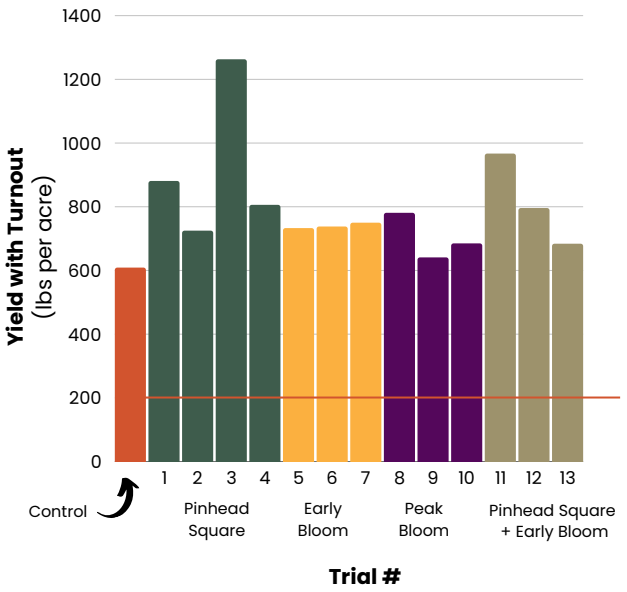
13 variations of rate and timing were tested. Applications were made at the pinhead square, early bloom, or peak bloom phases. We also ran three trials with two Accelerate™ applications each, applied at both pinhead square and early bloom. Rates of Accelerate™ varied from 1 to 12 quarts per acre. Each variant was replicated 4 times across 4 plots in the same field.
The harvested cotton from each trial variant and the control was analyzed separately for yield, turnout, and loan value at the gin.

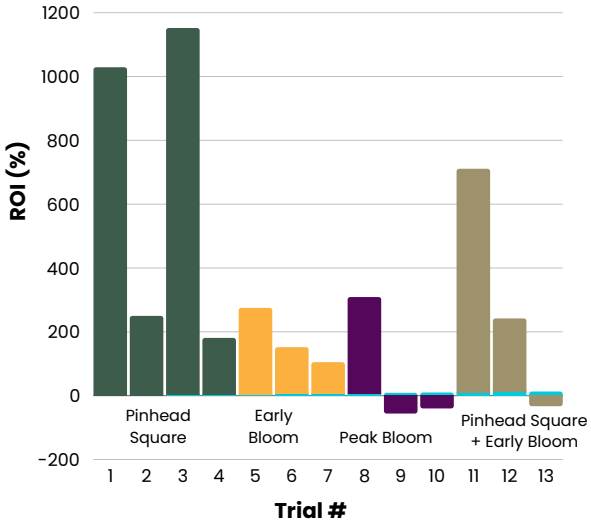
The ROI accounted for the cost of product as well as a $10/acre application cost for labor and fuel.

Results

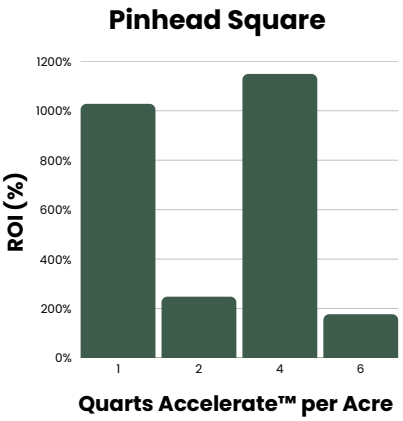
Variant	Phase	Quarts Accelerate™ per acre	Yield Increase over control	Turnout
1	Pinhead Square	1	39%	42.25%
2	Pinhead Square	2	15%	42.26%
3	Pinhead Square	4	98%	42.57%
4	Pinhead Square	6	25%	42.94%
5	Early Bloom	2	13%	43.52%
6	Early Bloom	4	18%	41.67%
7	Early Bloom	6	25%	40.16%
8	Peak Bloom	3	25%	41.89%
9	Peak Bloom	6	2%	41.81%
10	Peak Bloom	12	8%	42.40%
11	Pinhead Square + Early Bloom	1	56%	41.44%
12	Pinhead Square + Early Bloom	2	33%	40.12%
13	Pinhead Square + Early Bloom	4	11%	41.32%
	Control	n/a	n/a	40.67%

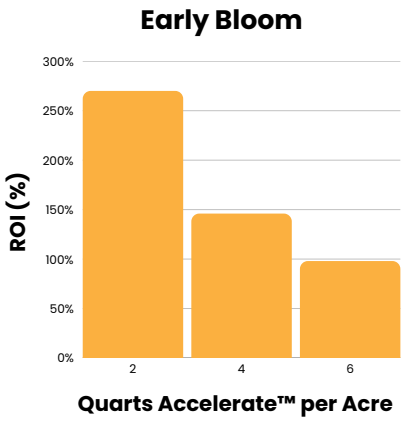
All 13 trials showed increased yields over the control, ranging from 2%-98%. Turnout increased in 11 of the 13 variants–turnout of the control was 40.67%, while the highest experimental turnout was 43.53%. We did not see any significant changes in loan value.

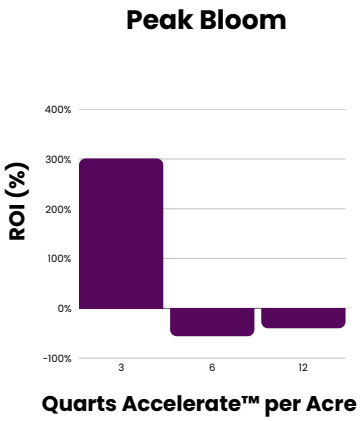




The most beneficial time to apply Accelerate™ was the earliest–the pinhead square stage. 1 quart per acre at that stage provided a 39% yield increase and a 10x ROI, while 4 quarts nearly doubled yields, and provided 11.5x ROI. Interestingly, the ROI dropped at 2 quarts per acre to only 2.5x–this anomaly requires further study. The ROI also dropped at the highest application level of 6 quarts per acre. This implies that Accelerate™ has an upper application limit for effectiveness at a given stage of plant growth based on leaf biomass, which is consistent with our prior experience.



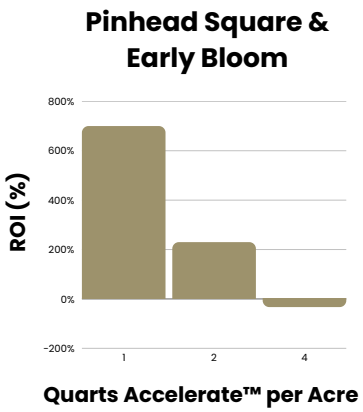




Accelerate™ applications at early bloom provided ROIs between 98% and 270%. The lowest application rate at this stage provided the most ROI. Marginal increases in yield occurred with increased product application, but their ROI was offset by the increased product cost.

By peak bloom, Accelerate™'s advantage seems to have been lost. It provided modest yield increases, of 2% to 25%, but the cost of the application meant that 2 of the 3 trials lost money. The lowest application rate at that stage–3 quarts per acre–still provided a 300% ROI, suggesting that if a grower were late to the game in applying Accelerate™, there could still be a chance to gain an advantage at peak bloom with a low-rate application.

Two applications–at both pinhead square and early bloom–provided sizable yield increases, but the increased application cost meant that the total ROI was less than a single application at pinhead square alone.



5. Conclusion

Accelerate™ provides a substantial benefit to cotton growers, even when used in isolation from other AEA products or regenerative practices. When applied early, at the pinhead square stage, it offers an impressive return on investment, even at very low rates. With a cost per acre as low as $6.40 that can provide a 10X ROI, Accelerate™ applications are something every cotton grower–whether conventional, organic, or regenerative–should consider to boost their profitability.

**These results are from West Texas cotton and may vary in other regions.*

Glossary of Cotton Terminology

Gin: A cotton processor
Lint: The usable fiber in raw harvested cotton
Loan Value: The value of a bale of cotton, determined at the gin based on a number of quality metrics
Turnout: The percentage of lint in the bulk cotton shipped to the gin

About Advancing Eco Agriculture

Advancing Eco Agriculture (AEA) helps farmers succeed by empowering them to grow crops that are more productive, resilient and profitable. We provide data-based agronomic consultation and a range of powerful liquid mineral nutrition and biological products.

AEA is dedicated to a whole-systems approach to revitalizing soil and plant health, looking beyond symptoms by diagnosing root causes and providing treatments. This approach, informed by more than 18 years of data and on-farm experience, increases yields and crop performance, reduces or eliminates the need for pesticides and fertilizers, and generates immediate economic returns for farmers.

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