Product Overview

- **Product Name:** EF Polymer
- **Description:** EF is a sustainable biodegradable polymer designed to improve water retention in soil, reduce irrigation needs, and enhance crop productivity. Tailored for sustainable agriculture, it is especially effective for crops like tomatoes and other field crops.
- **Applications:** Suitable for a wide variety of crops, including row crops. Beneficial for regions with unpredictable rainfall or for growers looking to optimize irrigation and fertilizer efficiency.

Key Benefits

- Enhances soil water retention, reducing irrigation needs by up to 40%.
- Improves nutrient availability and minimizes leaching losses.
- Encourages healthy root development and boosts crop yields.
- Fully biodegradable and safe for the environment.

Technical Specifications

- **Composition:** Pectin-based, organic, non-toxic polymer blend.
- **Appearance:** Fine powder or granules.
- **Water Absorption Capacity:** Absorbs up to 50x its weight in water.
- **pH Range:** Neutral (4.0 - 9.0).
- **Biodegradability:** 100% within one year under typical field conditions.

Application Guidelines

- **Direct seeding**:
  - Broadcast EF Polymer ov soil at the rate of 17 lbs (8kg) per acre.
  - Incorporate into the top 1.5 - 2.5 inches of soil during field preparation to optimize water retention.
- **With dry fertilizer**:
  - Mix EF Polymer with dry fertilizer at desired rate
  - Shank both polymer and fertilizer during strip till

EF Polymer Cotton Trial — Texas A&M AgriLife (Snook, TX) – 2025
Trial Location: Texas A&M AgriLife Research, Field 310, Snook, Texas, USA
Collaborator: Dr. Benjamin McKnight, Texas A&M AgriLife Extension Service
Crop: Cotton
Season: 2025

1. Study Overview

EF Polymer (EFP) was evaluated in a 2025 cotton field trial at Texas A&M AgriLife in Snook, Texas, to assess its potential to improve cotton performance and support fertilizer reduction without reducing yield or economic return. The trial was designed to test EFP under two contrasting production environments - Dryland and Irrigated - to better understand how the product performs under both water-limited and water-sufficient conditions.
The study followed a randomized complete block design (RCBD) with four blocks and five treatments. Treatments included a no-polymer control with full fertilizer, granule EFP at 17.8 lb/ac with both 100% and 85% fertilizer, and a higher BB EFP rate (100 lb/ac) with both 100% and 85% fertilizer. EFP was uniformly broadcast into plots using a handheld rotary broadcaster and incorporated to a depth of approximately 2 inches using a rolling cultivator behind a tractor. Standard cotton management practices were followed throughout the season. Key measurements included seed cotton weight, turnout, lint yield, loan value, and gross lint return ($/ac).

2. Trial Objectives

The trial was conducted to answer two key questions:
1. Can EF Polymer improve cotton lint yield under dryland and irrigated conditions?
2. Can EF Polymer enable fertilizer reduction to 85% of the standard program without reducing yield or gross return?

3. Experimental Design

Treatment	EF Polymer Rate (lb/ac)	Fertilizer Program
Control	0	100%
T2	17.8	100%
T3	17.8	85%
T4	100	100%
T5	100	85%

Design Summary

- **Design:** Randomized Complete Block Design (RCBD)
- **Replications:** 4
- **Environments:** Dryland and Irrigated
- **Harvest Date:** October 1, 2025
- **Application Method:** Broadcast by handheld rotary broadcaster and incorporated to ~2 inches depth

4. Results

4.1 Dryland Trial

Under dryland conditions, EFP showed a **directionally favorable response**, with three polymer treatments numerically exceeding the control in lint yield. The strongest responses were observed in the **100 lb/ac** BB EFP treatments and in **17.8 lb/ac granule EFP with 85% fertilizer**, which were approximately **16-19% higher in lint yield than the control**. Statistical analysis suggested a **borderline or marginal treatment effect** under dryland conditions, indicating that EFP may be contributing positively under water-limited conditions, although additional replication would be needed to confirm significance with higher confidence.

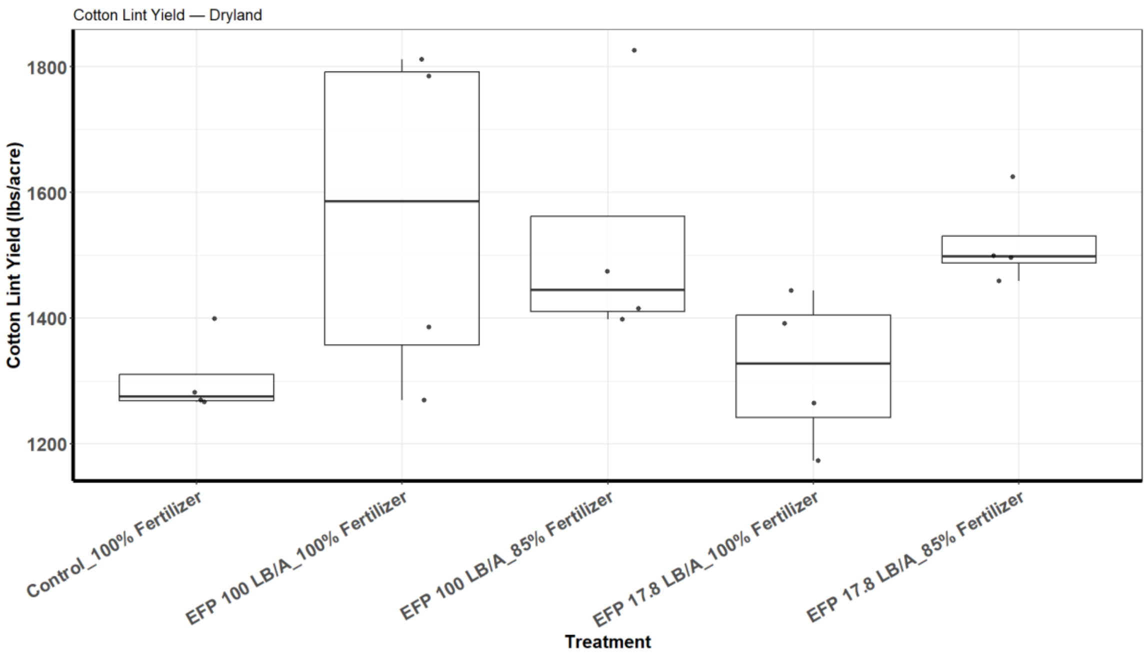

Figure 1. Cotton lint yield of EF Polymer amended in dryland conditions

4.2 Irrigated Trial

Under irrigated conditions, treatment effects were **not statistically significant**, indicating that differences among treatments could not be confirmed statistically in this trial. However, the treatment method was still informative. EFP remained **neutral to positive** relative to the control, and the treatments combining EFP with **85%**

fertilizer were among the best-performing numerically. This suggests that EFP may help support fertilizer efficiency even when water is not limiting.

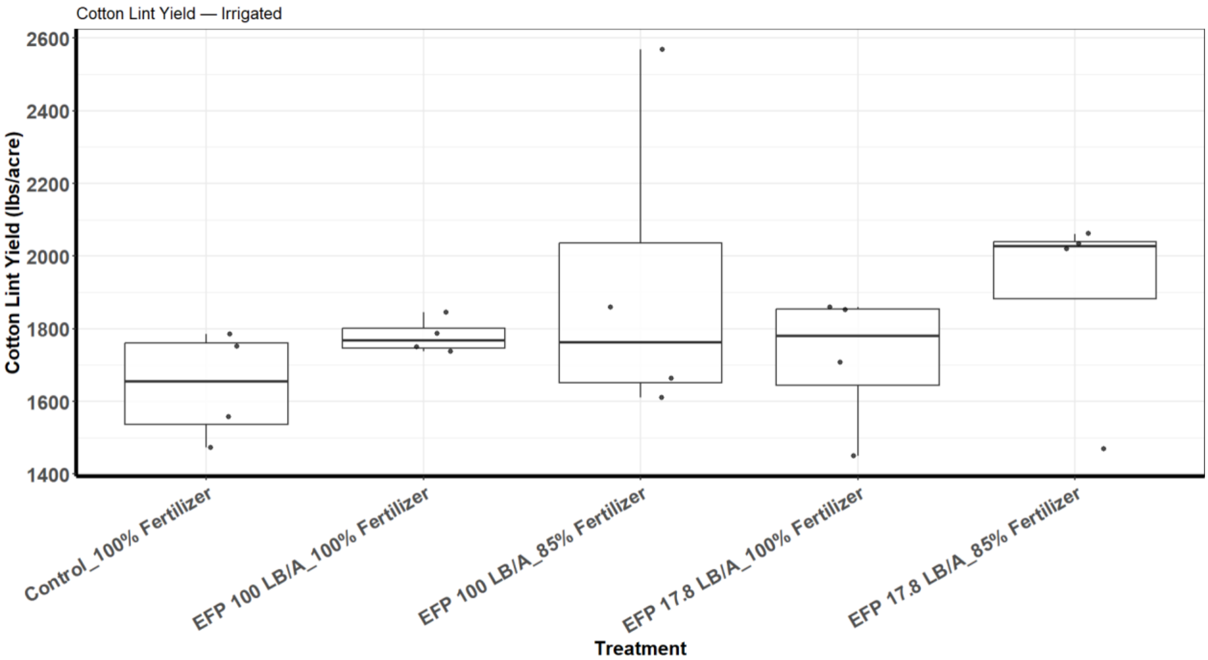

Figure 2. Cotton lint yield of EF Polymer amended in irrigated conditions

5. Economic Summary

Mean Gross Lint Return by Treatment

Treatment	Dryland ($/ac)	Irrigated ($/ac)
Control	735	902
EFP 17.8 lb/ac + 100% fertilizer	730	963
EFP 17.8 lb/ac + 85% fertilizer	765	976
EFP 100 lb/ac + 100% fertilizer	863	1,052
EFP 100 lb/ac + 85% fertilizer	821	983

Across both environments, the highest gross return was consistently observed in the 100 lb/ac EFP + 100% fertilizer treatment. Importantly, both 85% fertilizer programs with EFP outperformed the control economically in both dryland and irrigated conditions, supporting the potential for fertilizer optimization with EFP.

6. Key Findings

- Under **dryland conditions**, three EFP treatments trended above the control, with lint yield increases of approximately **16-19%** in the best-performing treatments.
- Under **irrigated conditions**, no statistically significant treatment effects were detected, but EFP remained **directionally neutral to positive** across treatments.
- In both environments, **EFP with 85% fertilizer** performed comparably to or better than the corresponding full-fertilizer programs, suggesting potential to reduce fertilizer inputs without hurting yield.
- The **highest gross return** in both dryland and irrigated trials came from **100 lb/ac EFP + 100% fertilizer**.
- The data across both environments were **directionally favorable for EFP**, particularly where fertilizer reduction was tested, although more replication would strengthen confidence in the results.

7. Conclusion

The 2025 cotton trials at Texas A&M AgriLife demonstrated a favorable directional response to EF Polymer across both dryland and irrigated production systems. While statistical significance was limited in some cases due to variability and plot-scale replication, EFP treatments compared well against the control in both agronomic and economic performance. The dryland trial showed encouraging evidence that EFP may enhance cotton performance under water-limited conditions.

A key outcome from this study was the strong performance of **EFP combined with 85% fertilizer**, which suggests that EF Polymer may help maintain cotton yield and gross return while reducing fertilizer inputs. These results support continued validation in larger on-farm trials and provide a useful foundation for developing a robust cotton application protocol for future commercial use.