Datasheet

Product Overview

- **Product Name:** EF Polymer
- **Description:** EF is an eco-friendly, biodegradable polymer designed to improve water retention in soils, reduce irrigation needs, and enhance crop productivity. Tailored for sustainable agriculture, it is especially effective for tomatoes and other field crops.
- **Applications:** Ideal for both direct-seeded and transplanted tomatoes, as well as other vegetables and row crops. Suitable for water-scarce regions or areas with erratic rainfall.

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:** Plant-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.

Evaluating the Impact of Biodegradable Superabsorbent Polymer on Processing Tomato Yield and Fruit Quality Under Deficit Irrigation Regimes

Location: UC Davis Research & Extension Center, Davis, CA
Season: 2025 Growing Season
Soil Type: Yolo Silt Loam
Design: Randomized Complete Block Design (RCBD), 4 Replications
Irrigation: Subsurface Drip (20–25 cm depth)

Study Overview

A second-year field evaluation was conducted to assess the agronomic and quality impacts of EF Polymer, a biodegradable fruit-peel derived superabsorbent polymer (SAP), under varying irrigation levels in processing tomato production.

The study tested:

- Three polymer rates: 0, 75, and 150 kg/ha
- Three irrigation regimes: 25%, 50%, and 100% of crop evapotranspiration (ETc)

Measurements included:

- Soil moisture profiles (neutron probe)
- Leaf Area Index (LAI)
- Marketable yield (kg/ha)
- Fruit quality (Brix, pH, color)
- Remote sensing (NDVI, water stress, CIR imagery)

The objective was to determine whether EF Polymer can improve water retention, maintain yield under deficit irrigation, and enhance fruit quality while reducing water use.

Treatment Summary and Irrigation Results

Treatment Label	Polymer Rate	Irrigation Level	Description
P0-ET25	0 kg/ha	25% ETc	Severe deficit, no polymer
P75-ET25	75 kg/ha	25% ETc	Severe deficit + low polymer
P150-ET25	150 kg/ha	25% ETc	Severe deficit + high polymer
P0-ET50	0 kg/ha	50% ETc	Moderate deficit, no polymer
P75-ET50	75 kg/ha	50% ETc	Moderate deficit + low polymer
P150-ET50	150 kg/ha	50% ETc	Moderate deficit + high polymer

P0-ET100	0 kg/ha	100% ETc	Full irrigation control
P75-ET100	75 kg/ha	100% ETc	Full irrigation + low polymer
P150-ET100	150 kg/ha	100% ETc	Full irrigation + high polymer

Total irrigation applied during season

- 25% ETc: 315 mm
- 50% ETc: 471 mm
- 100% ETc: 997 mm

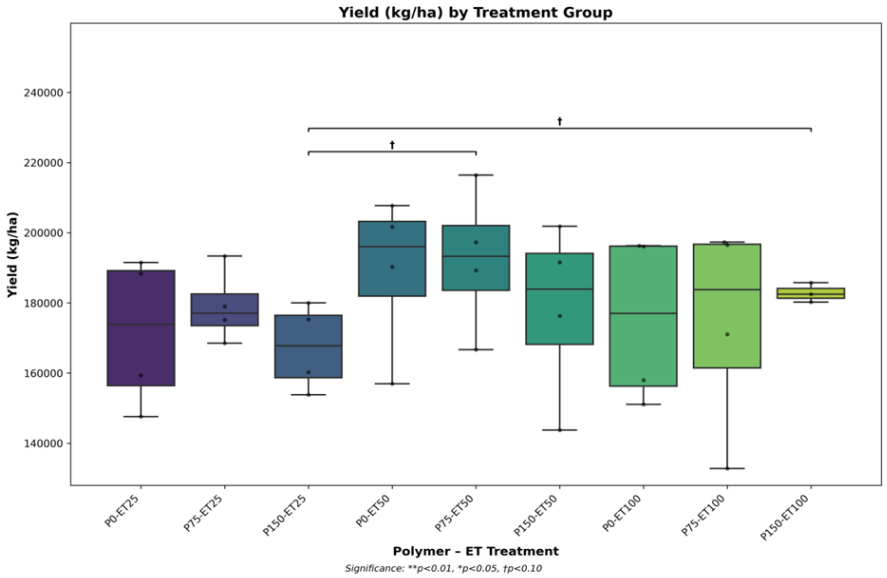

Figure 1. Processing tomato yield (kg/ha) for each polymer–irrigation (ET) treatment

Key Findings

- **Irrigation level was the primary yield driver**
  - 50% ETc maximized yield.
  - 100% ETc did not improve yield despite higher water use.
- **EF Polymer improved soil moisture retention under severe deficit**
  - Particularly within upper root zone (0–90 cm).
- **Yield stability increased with polymer**
  - Reduced variability across irrigation regimes
- **Brix improved under severe deficit with polymer**
  - Polymer amplified soluble solids concentration at 25% ETc.

- **Fruit pH and color within commercial range**
    - Irrigation influenced color more than polymer.

Conclusion

The 2025 UC Davis field trial demonstrates that irrigation level was the primary driver of processing tomato yield, with 50% ETc achieving the highest productivity while using substantially less water than full irrigation. EF Polymer did not consistently increase total yield but provided meaningful agronomic benefits under water-limited conditions, including improved soil moisture retention, reduced yield variability, and enhanced fruit Brix under severe deficit irrigation (25% ETc). These results indicate that EF Polymer functions best as a moisture-buffering and quality-enhancing tool within optimized deficit irrigation strategies rather than as a standalone yield booster.