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.

EF Polymer in Romaine Lettuce Production Under Reduced Irrigation

1. Study Overview

Background

Romaine lettuce production in the Southwestern United States is highly dependent on irrigation, with increasing pressure to reduce water use due to regulatory, environmental, and economic constraints. Efficient irrigation management is particularly critical in desert production systems such as Yuma, Arizona.

EF Polymer is a biodegradable soil amendment designed to enhance soil water retention and improve plant access to moisture in the root zone. This trial evaluated whether EF Polymer can support crop performance under reduced irrigation conditions in a commercial lettuce production system.

Objectives

1. Evaluate the impact of reduced irrigation on romaine lettuce yield and crop performance
2. Assess whether EF Polymer can maintain or improve crop performance under reduced irrigation.
3. Investigate plant physiological responses and soil moisture dynamics across treatments.

2. Trial Overview

- **Location:** Yuma, Arizona, USA
- **Crop:** Romaine Lettuce (Variety: Del Sol)
- **Design:** Randomized complete block with six treatments and six replications

Agronomic Context

- Typical Yuma lettuce systems rely on high irrigation inputs
- Soil moisture management is critical for yield and quality
- Environmental conditions during the trial were warmer than average, accelerating crop development

3. Experimental Design and Treatments

Treatment Structure

Treatment	Irrigation	EF Polymer rate
T1	Full irrigation	0 (control)
T2	Full irrigation	8 kg/ac
T3	Full irrigation	16 kg/ac
T4	Reduced irrigation	0 (control)
T5	Reduced irrigation	8 kg/ac
T6	Reduced irrigation	16 kg/ac

- **Replications:** 6
- **Bed configuration:** 42-inch beds, 3-line romaine

Polymer Application

- Applied once pre-plant
- Broadcast over seed beds
- Incorporated during bed preparation

- Application aligned with standard fertilizer incorporation practices

Irrigation Regimes
- **Full irrigation total:** 14.128 acre-inches
- **Reduced irrigation total:** 10.966 acre-inches i.e. 22% reduction in total irrigation water

Irrigation included:
- Sprinkler irrigation during establishment
- Transition to drip irrigation for crop development

4. Data Collection

Harvest Measurements
- Above-ground biomass per plant
- Marketable heart weight
- Walk-by percentage (non-marketable plants)
- Heart circumference and length

Plant Physiology Measurements
- Stomatal conductance
- Transpiration rate
- Chlorophyll content
- Photosynthesis and gas exchange traits

5. Key Findings

- Irrigation was successfully reduced by **22%** without significant yield loss.
- Yield differences between treatments were minimal.
- Reduced irrigation increased variability in crop performance.
- EF Polymer improved consistency under reduced irrigation conditions.
- Physiological indicators suggest improved plant water status with EF Polymer.

6. Conclusions

This University of Arizona field trial demonstrates that irrigation inputs in romaine lettuce production can be reduced by approximately 22% without compromising yield.
EF Polymer did not significantly increase yield but showed consistent directional benefits in improving crop uniformity and stabilizing performance under reduced irrigation conditions.
The combination of optimized irrigation strategies and EF Polymer presents a promising approach for improving water use efficiency and reducing production risk in water-limited environments.