

## Ongoing Chemigation Experiment Update

**CROP:** Head Lettuce – Havasu – Planted 01/27/2026

**WEEDS:** Sudan Grass (Heavy seedbank pressure) and Goosefoot. Some Common Purslane started to germinate recently.

**APPLICATION:** CO2-Pack back Sprayer and Chemigation (Custom venturi injection unit)

**STATUS:** Ongoing – Trial (Yuma Ag Center – Visitors are welcome)

### What Is This Trial About?

This trial is about utilizing customized venturi units to inject Kerb herbicide into the sprinkler irrigation system.

**This trial is made possible through partial funding from the Western IPM Center.**

The two main weed species in this trial are Sudan Grass (*Sorghum sudanense*), a residual grass from the previous seedbank that can also release allelopathic compounds suppressing lettuce germination, and goosefoot (*Chenopodium* spp.), a fast-growing broadleaf that competes aggressively with lettuce for water and light.

The goal of this trial is to evaluate the possibility of delivering Kerb (pronamide) effectively through a sprinkler irrigation system using a custom venturi chemigation unit, rather than injecting through the pump or using expensive equipment. The experiment is also evaluating the efficacy of applying Hydrovant fA with Kerb. Hydrovant is a polymer-based, non-ionic activator-sticker adjuvant from [Corbet Scientific](#) designed to enhance agricultural chemical performance, including herbicides, fungicides, and insecticides. It works by forming a protective, elastic, and breathable coating on plant surfaces, reducing rain-fastness issues and increasing pesticide, nutrient, and bio-stimulant retention. Hydrovant was applied at two rates, 0.1% v/v and 1% v/v. Prefar (bensulide) was applied conventionally by a backpack sprayer.

## How Were Herbicides Applied?

### Prefar – Conventional Sprayer

Prefar was applied on January 30, 2026 (the wet date) – the same morning that first irrigation began – using a CO2 backpack sprayer at 20 GPA. The herbicide was applied to the soil surface and incorporated with the sprinkler irrigation.

### Kerb – Chemigation Through Sprinklers

**Kerb** was applied 5-6 days after planting (DAP) by injecting it directly into the sprinkler irrigation system using a custom venturi injection unit. The venturi creates suction through pressure differential – as water flows through a constriction in the pipe, it draws the herbicide solution from the stock tank into the system. The venturi system was calibrated by measuring how long it takes to draw a certain amount of water. Kerb was injected during the last 3 hours of irrigation, with one hour of active injection followed by a water flush to push the herbicide into the germination zone.

**Hydrovant fA** was tank-mixed with Kerb where applicable and chemigated together in a single injection event.



*Photo: Custom venturi chemigation unit used to inject Kerb into the sprinkler irrigation mainline at the Yuma Ag Center trial. The venturi system requires no pump — it operates on the pressure differential created by flowing irrigation water.*

## Why was Hydrovant used in this Trial?

The concept is that when Hydrovant chemigated with Kerb, it might help distribute the herbicide more evenly in the soil and penetrate deeper into the weed germination zone, potentially improving control consistency in the soil. Two concentrations were tested: 0.1% (low rate) v/v and 1% v/v (high rate). The higher rate is used to see if there is any phytotoxicity on lettuce. The results of this comparison are among the most important findings in the trial. Hydrovant had not been characterized in combination with Kerb for Yuma lettuce production prior to this trial, making these results novel for the region.

## Field Condition: What Made This Trial Challenging

I have to acknowledge the field conditions that shaped the data. Two issues in particular affected this trial and need to be understood before interpreting the results.

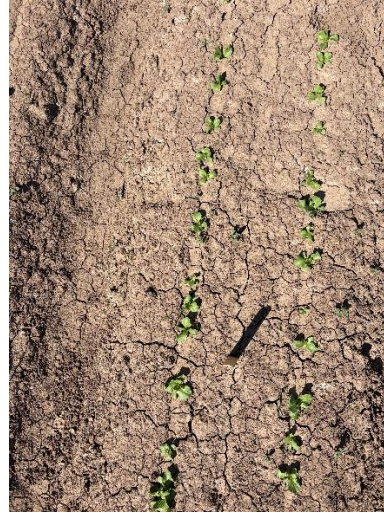


**Issue 1 – Heavy Sudan Grass Seedbank:** This field has a documented history of Sudan grass from previous planting. The untreated plot (UTC) showed approximately 125 plants/m<sup>2</sup>, a density far higher than a typical commercial lettuce field. At this level, Sudan grass creates not just competition for water and light but allelopathic chemical pressure on germinating lettuce seeds. This makes every herbicide job harder and means percent control figures from this trial reflect performance under unusually severe weed pressure.

**Issue 2 – Cloddy Seedbed:** Bed preparation before planting left large soil aggregates on the surface. This hurt Prefar application most directly – Prefar depends on uniform contact with fine soil surface to form a continuous herbicide barrier. In cloddy condition, the spray sinks into gaps between clods rather than coating the surface evenly. Additionally, when irrigation started, collapsing clods displaced soil over the lettuce seeds that contributed to variability unrelated to herbicide effects.



*Photo: Bed surface at trial establishment showing large clod aggregates. This condition reduced Prefar efficacy and caused uneven lettuce emergence across all treatments.*

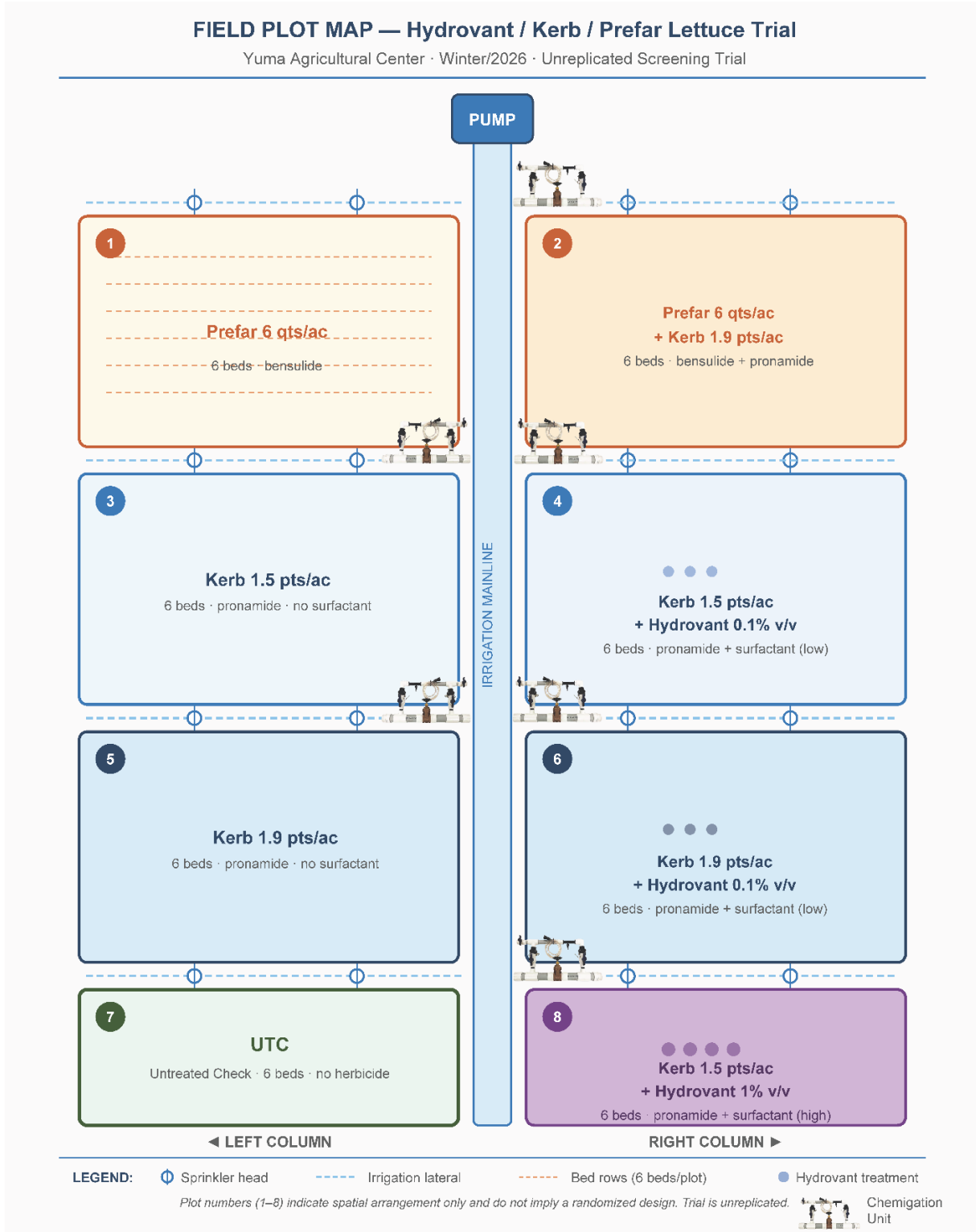


*Photo: Soil crusting adjacent to sprinkler nozzle positions caused by asymmetric water distribution from road guard deflectors.*

## Trial Treatments

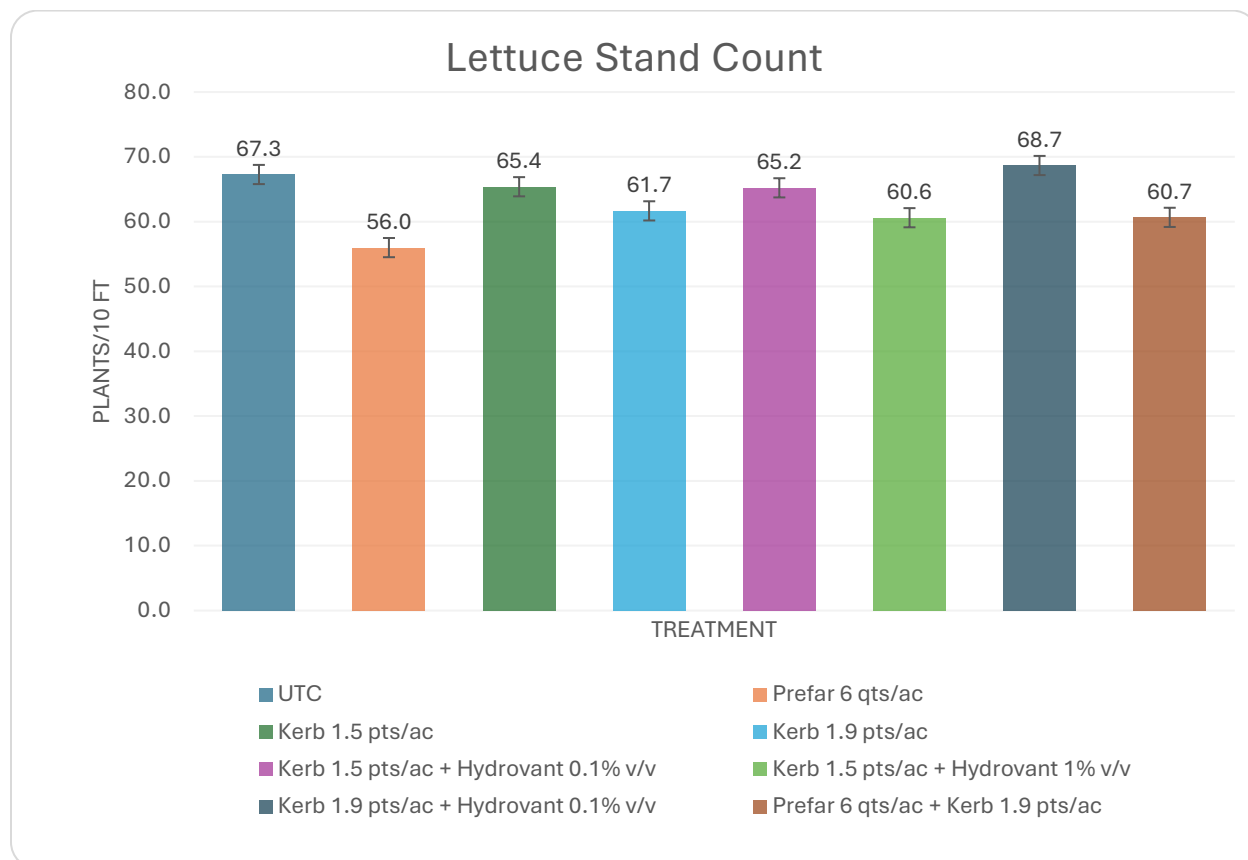
Plot	Treatment	What It Tests and How It Was Applied
#1	Prefar 6 qts/ac	Prefar was applied with a CO2 sprayer at 20 GPA.
#2	Prefar 6 qts/ac + Kerb 1.9 pts/ac	The broad-spectrum combination – Prefar was applied by a backpack sprayer prior to the wet date. Kerb was chemigated 5-6 days after plating. This combination is designed to test whether pairing both modes of action covers the full weed spectrum better than either product alone.
#3 & #5	Kerb 1.5 and 1.9 pts/ac	Kerb was chemigated through sprinkler irrigation 5-6 days after planting.
#4	Kerb 1.5 pts/ac + Hydrovant 0.1% v/v (low rate)	Kerb was chemigated with Hydrovant at low rate, tank mixed, and injected through the venturi unit. Test whether a low or high rate will affect on Kerb efficacy and crop injury.
#7	Untreated - UTC	No herbicide applied
#8	Kerb 1.5 pts/ac + Hydrovant 1% v/v (high rate)	Kerb was chemigated with Hydrovant at a high rate. The key is to see if Hydrovant improves Kerb efficacy.

## Trial Treatments Layout:

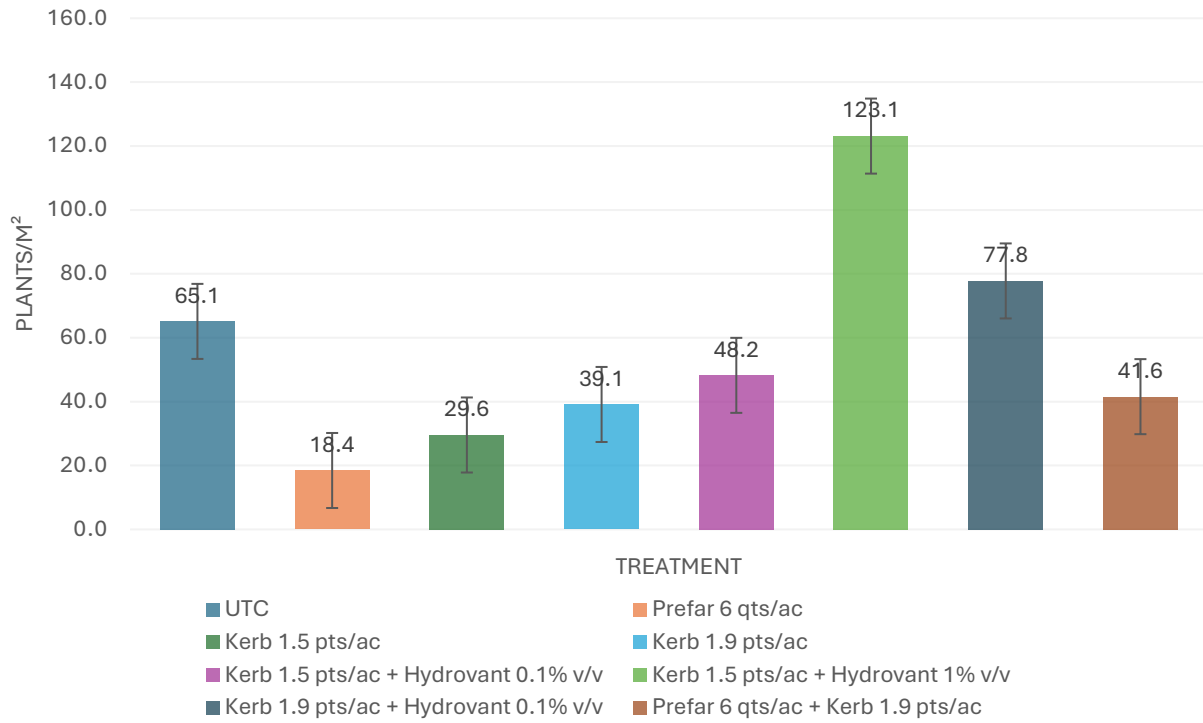


## Preliminary Results – What the Data Shows

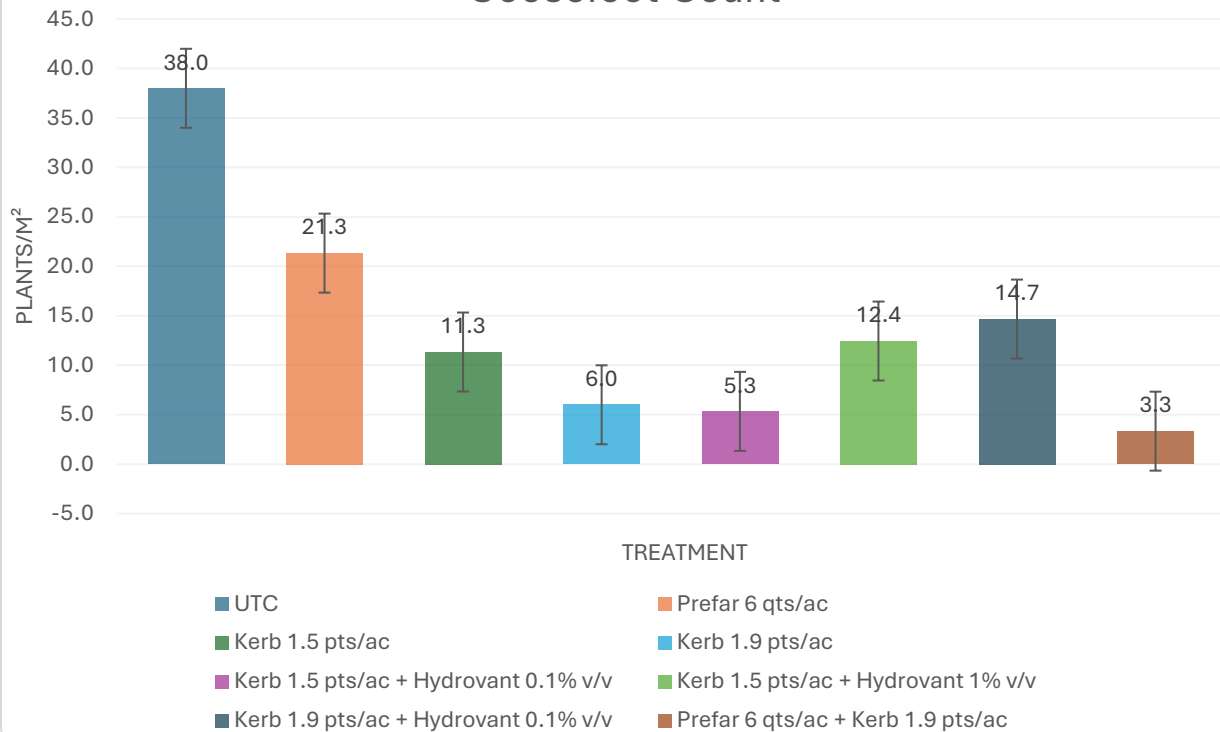
The graphs below are from the first evaluation at 14 days after treatment. This trial is still ongoing – additional evaluations are being conducted every 1-2 weeks.

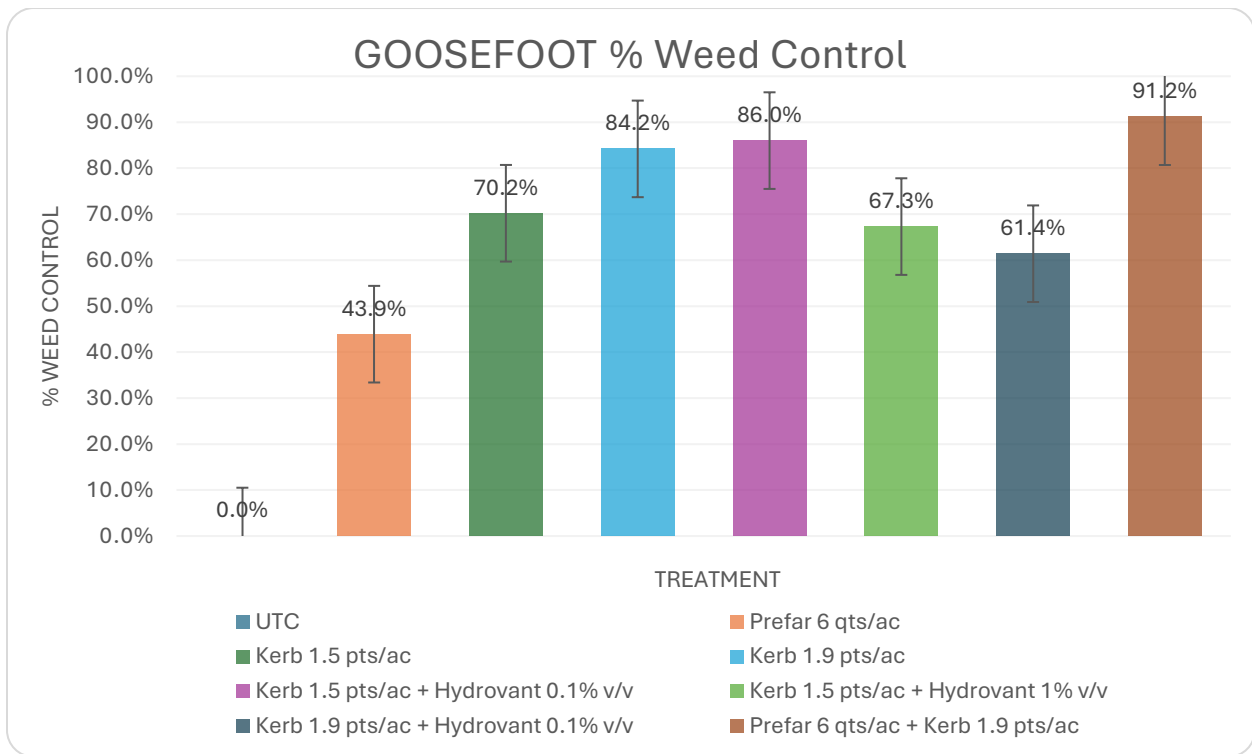
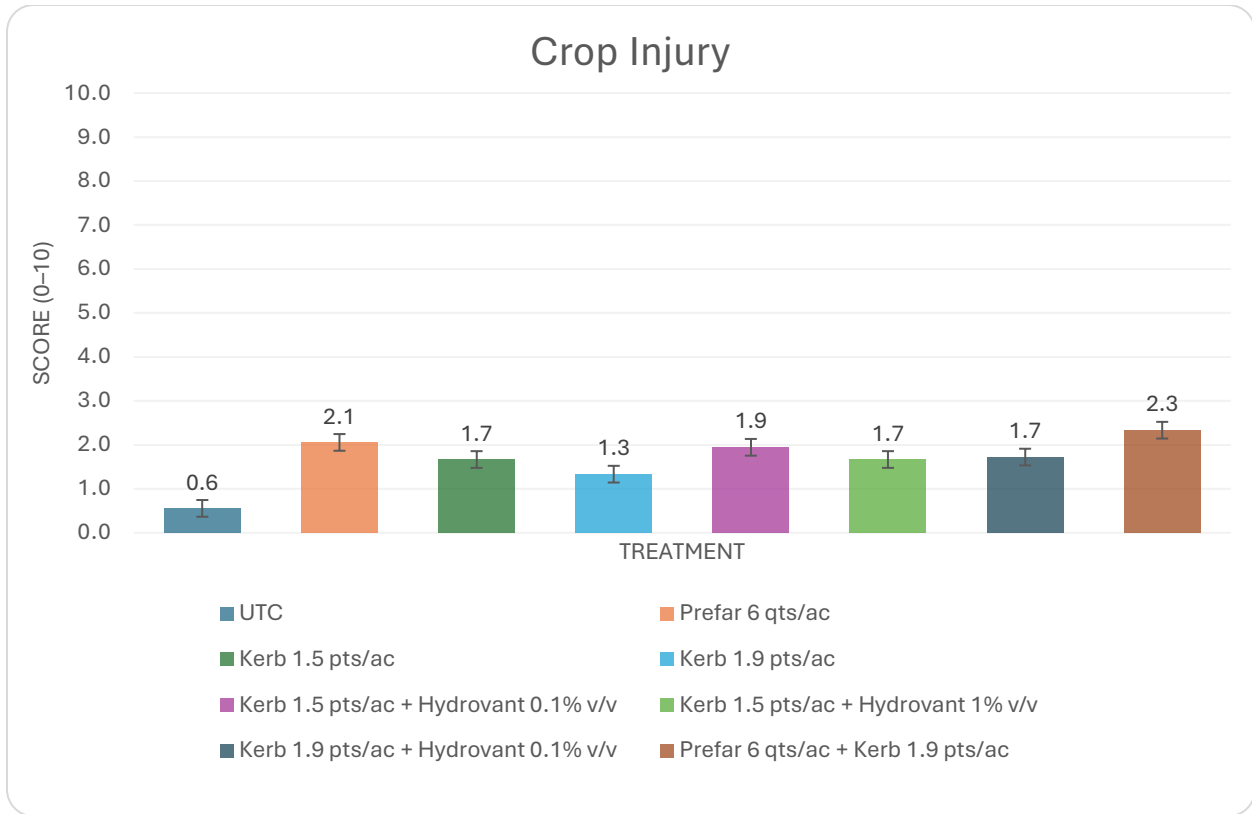


### Sudan Grass Count



### Goosefoot Count





**Note:** Abbott's Formula: % WC = (UTC mean - Treatment mean) / UTC mean × 100 | UTC = 0% by definition

## COME SEE THE TRIAL

You are more than welcome to visit the trial site at the Yuma Agricultural Center.

*Walk the plots · Discuss the data with us*

Growers · PCAs · Industry Representatives · All Welcome

## Preliminary Takeaway Message

**Note:** *These observations are from a single unreplicated screening trial. Always follow herbicide labels and consult your PCA before making program changes on these results.*

1. Chemigation of Kerb through the sprinkler irrigation appears feasible and effective. Early results support the venturi chemigation approach as a practical alternative to ground sprayer application in lettuce.
2. Results showed Hydrovant at 1% v/v reduces Kerb effect on Sudan grass-infested fields. However, no signs of phytotoxicity were observed on lettuce.
3. Bed preparation quality directly affects pre-emergent herbicides performance. The cloddy seedbed reduced Prefar's efficacy in this trial. A fine firm seedbed is the foundation of any pre-emergent herbicide program, regardless of application method.
4. For fields with Sudan grass pressure, Prefar 6 qts/ac remains a strong grass suppression tool, but the 71.7% control rate in this trial came with an injury score of 2 and the lowest lettuce stand count.