

# Using CropManage online tool for irrigation decision support of alfalfa



 **University of California**  
Agriculture and Natural Resources

**Michael Cahn**  
Irrigation and Water Resources Advisor  
UC Cooperative Extension, Monterey County



# Various Approaches to Irrigation Scheduling

**Weather-based**



**Plant-based**



**Soil-based**



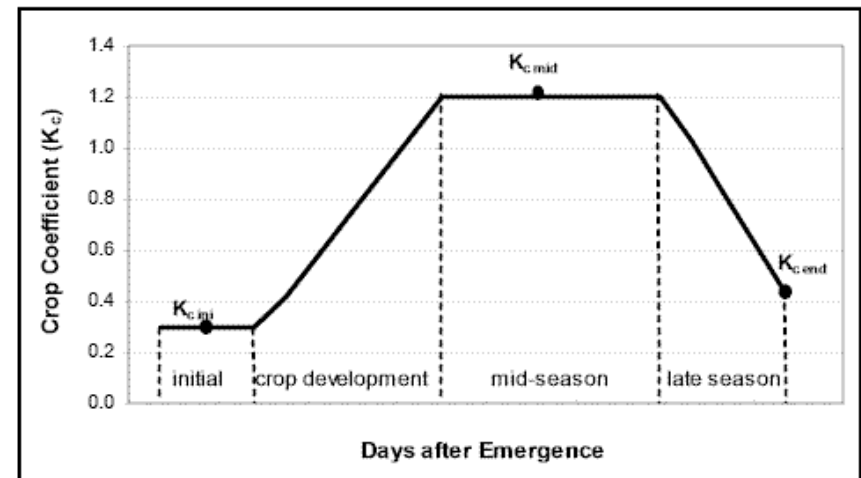
# Weather-based irrigation scheduling



Converting Reference ET to  
Crop ET:

$$ET_{\text{crop}} = ET_{\text{ref}} \times K_{\text{crop}}$$

$K_c$  can vary from 0.1 to 1.2

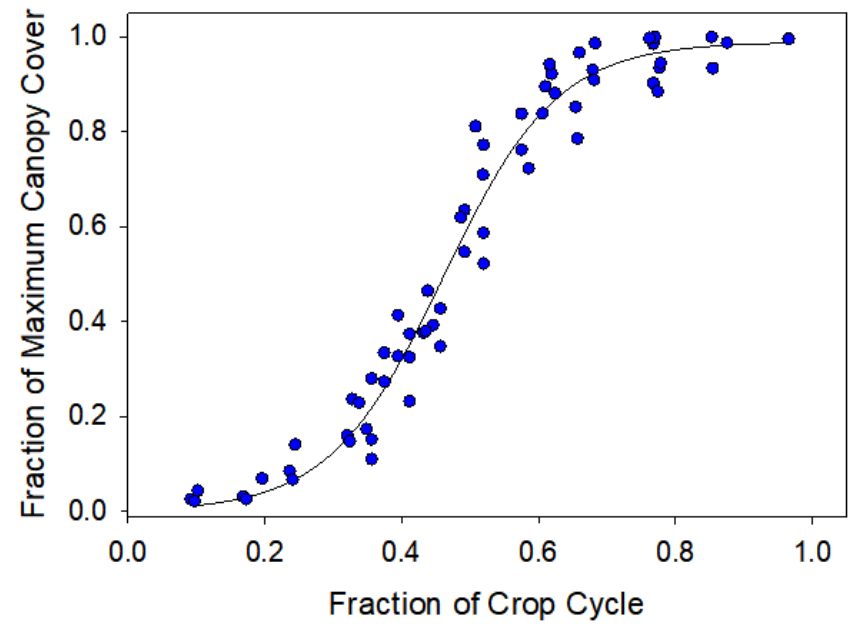
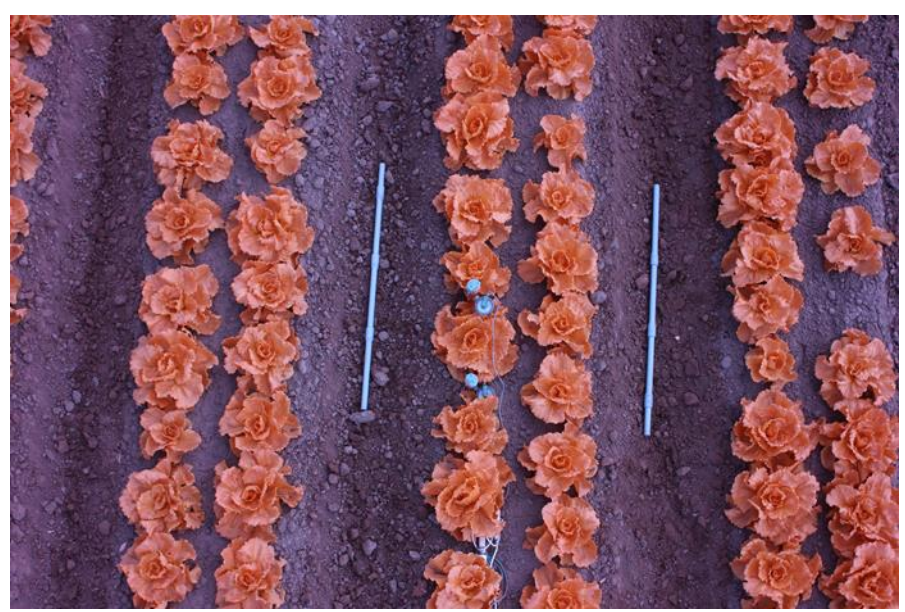




# Harvest affects the crop coefficient ( $K_c$ ) of alfalfa



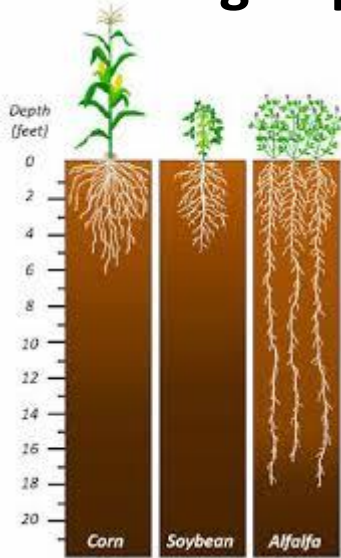






# Other information needs to be considered

## Rooting depth



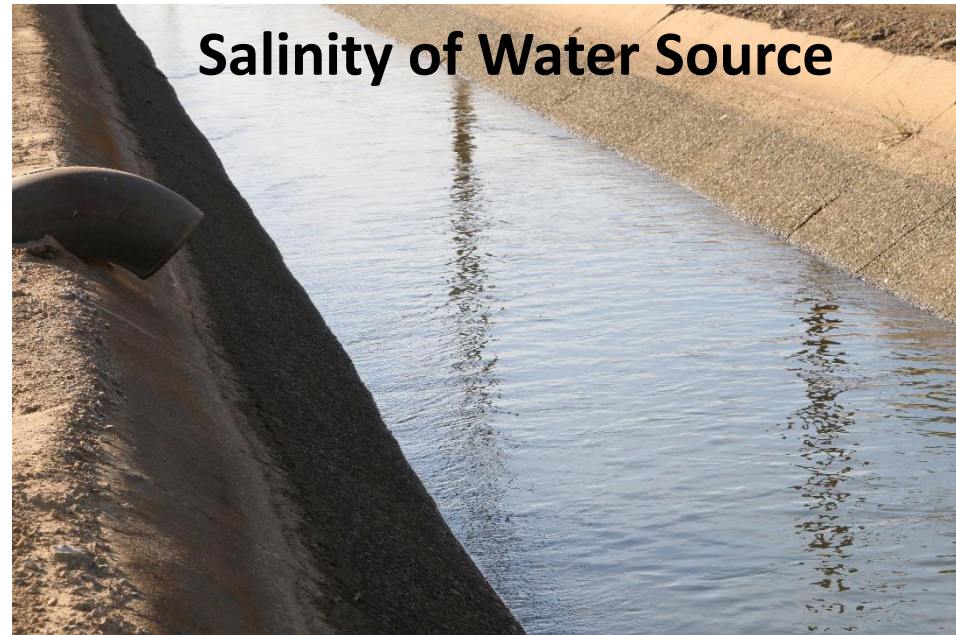
## Irrigation System Uniformity and Application Rate



## Soil Type



## Salinity of Water Source



# On-farm challenges in implementing field specific water recommendations

- ✓ **Multiple fields/crops to manage and track**
- ✓ **Other decisions and activities to coordinate**
- ✓ **Calculations involved are time consuming**



# CropManage: Online irrigation and nutrient management decision support tool

☆ Alfalfa irrigation trial ✕

1 Jan 2020 - 30 Dec 2020 ⚙️ 📅 📄 📊

Upcoming **Past** 📅

**8 Sep 2020**

💧 Sprinkler 8 hr

**29 Aug 2020**

🪄 Cutting 34 days

**25 Aug 2020**

💧 Sprinkler 4 hr

**20 Aug 2020**

💧 Sprinkler 7 hr

View all events by: ☰ 📅

[cropmanage.ucanr.edu](http://cropmanage.ucanr.edu)



# What CropManage does:

- ✓ **Provides site-specific recommendations for irrigation (and nitrogen management) based on soil type, climate, crop type, and crop development stage**
- ✓ **Uses research-based algorithms for developing recommendations**
- ✓ **Maintains records on water and nutrient management**



# Vegetable Crops Currently Supported

Broccoli

Brussels sprout

Cabbage (red and green)

Cauliflower

Celery

Cilantro

Lettuce (Romaine, iceberg, leaf, baby)

Mizuna

Pepper (Red bell pepper)

Spinach (baby, teen, bunch)

Tomato (processing tomato)



# Perennial Crops Currently Supported

Strawberry  
Raspberry  
Almonds  
Walnut  
Alfalfa



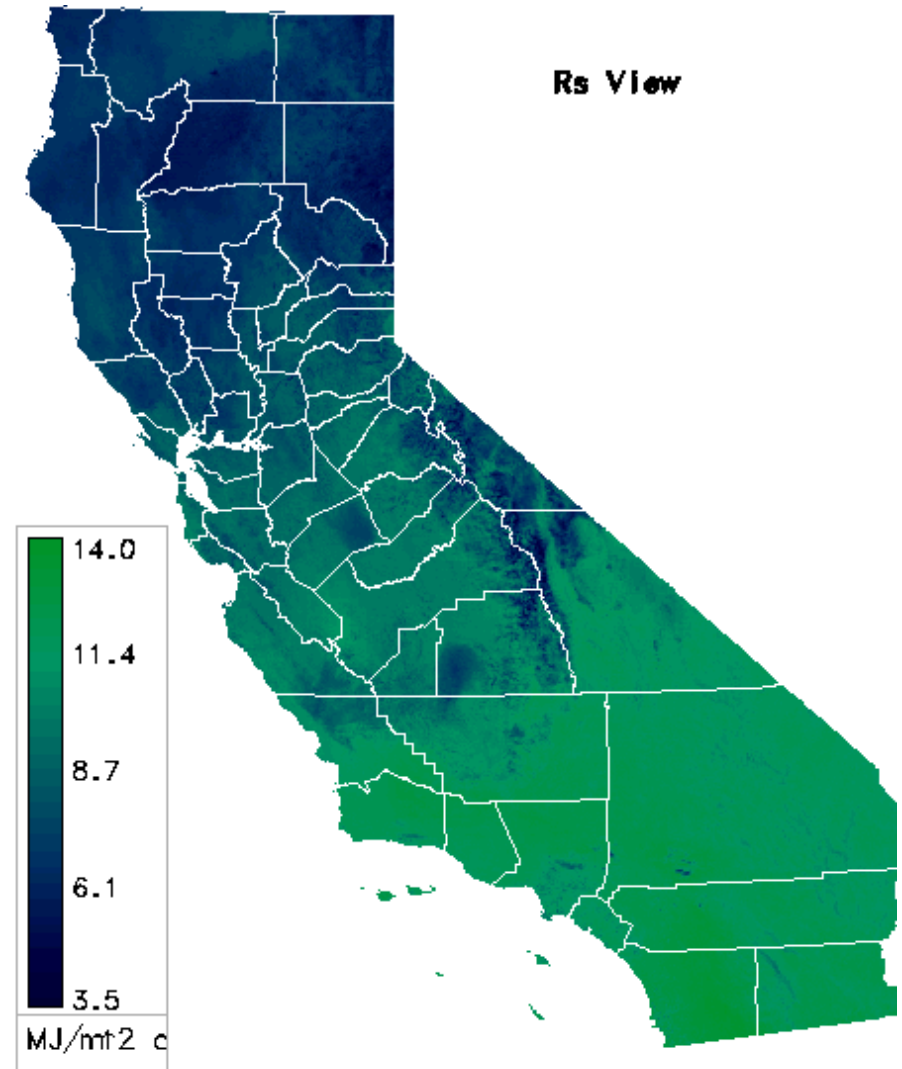


# Steps to Using CropManage

1. Open web browser to [cropmanage.ucanr.edu](http://cropmanage.ucanr.edu)
2. Establish user login (free)
3. Set up a ranch
4. Add a planting
5. Enter soil and tissue tests, irrigation, fertilizer, and cutting events (for alfalfa)

# CropManage reference ET data

- Includes ~150 CIMIS stations
- Spatial CIMIS option
- Historical ETo data (for future irrigations)





# Add an irrigation event

### Add Watering Event ✕

10/06/2020

Irrigation Method  
Sprinkler ▼

**Recommendations** ⓘ inches hours

Recommended Amount ⓘ 7.13 hours

Manager Amount  hours

[Recommendation Summary](#) ▼

**Water Applied**

hours

Cancel Create

### Add Watering Event ✕

**Recommendations** ⓘ inches hours

Recommended Amount ⓘ 7.13 hours

Manager Amount  hours

[Recommendation Summary](#) ^

Average ET ⓘ 0.17 in./day

Average Crop Coefficient ⓘ 0.73

Distribution Uniformity ⓘ 75.00%

Days Since Last Irrigation ⓘ 13 Days

Leaching Requirement ⓘ 0% (0.0)

Total Precipitation ⓘ 0.00 in.

Total Crop ET = Average ET x Average Crop Coefficient x Days Since Last Irrigation

1.60 in. = 0.17 x 0.73 x 13

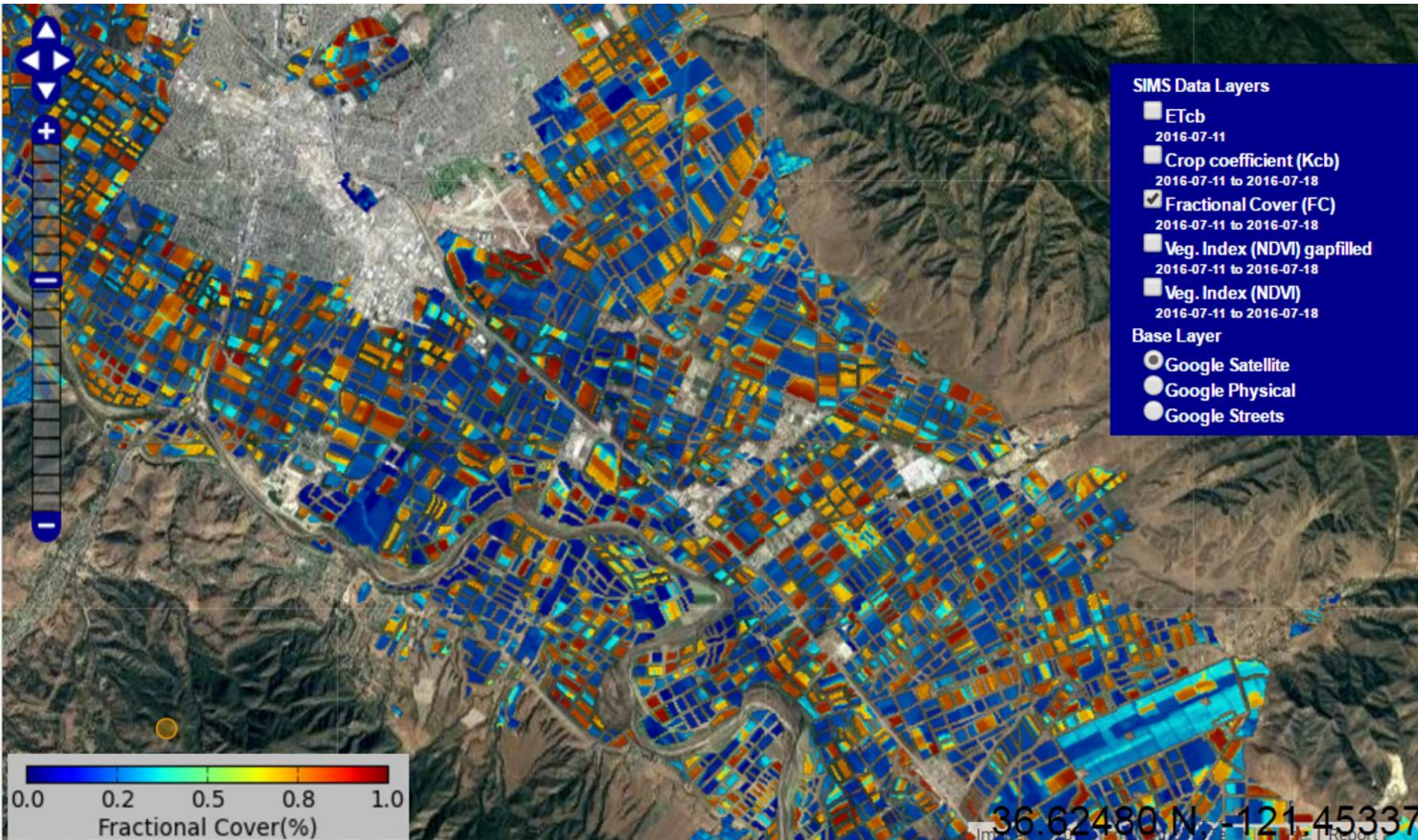
Recommended Irrigation Amount = Base Amount / (1 - Leaching Requirement) - Total Precipitation

2.14 in. = (1.60 in. x 100 / (75.00 \* (1 - 0))) - 0.00 in.)

Date	ET	Source	Last Modified
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Cancel Create

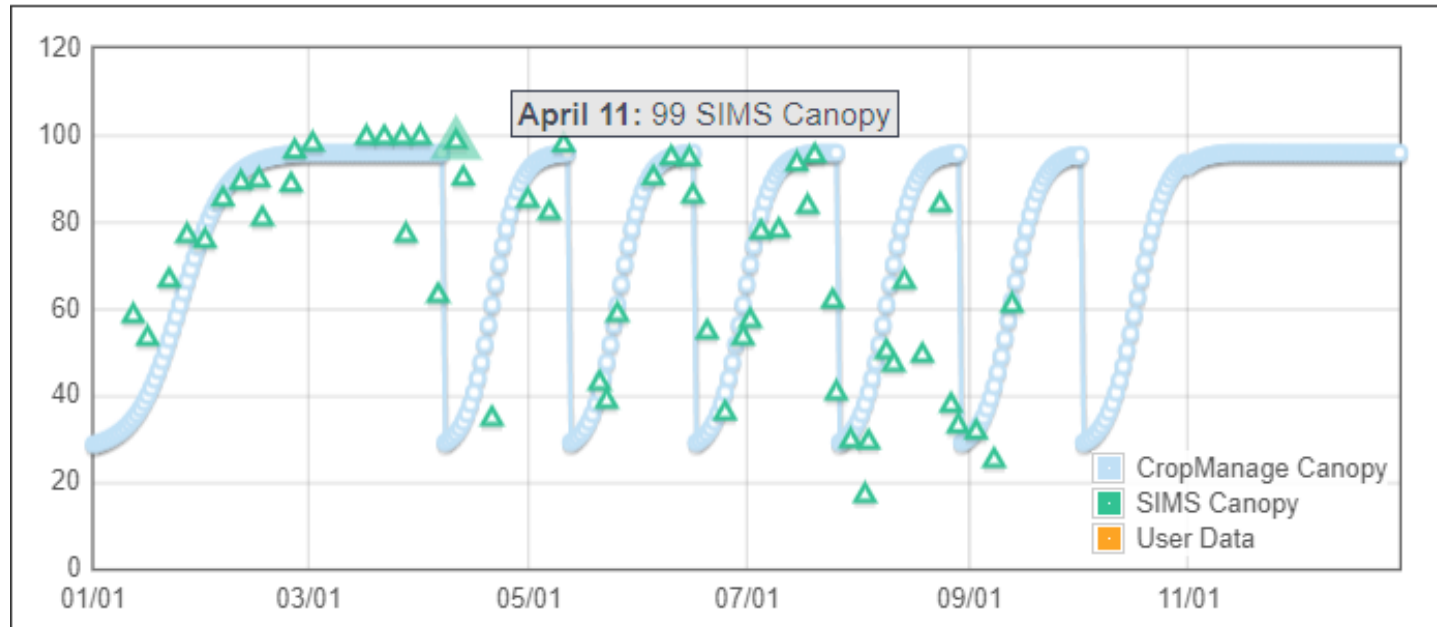
# CropManage interfaces with Satellite Irrigation Management Support (SIMS)





# Satellite data can be used to confirm canopy development model

Alfalfa irrigation trial Canopy Curve



CropManage Canopy Parameters [Reset to Default Parameters](#)

Max. Canopy ⓘ

96.1

96.1%



Minimum Canopy ⓘ

27.3

27.3%



Canopy A ⓘ

3.9

3.9



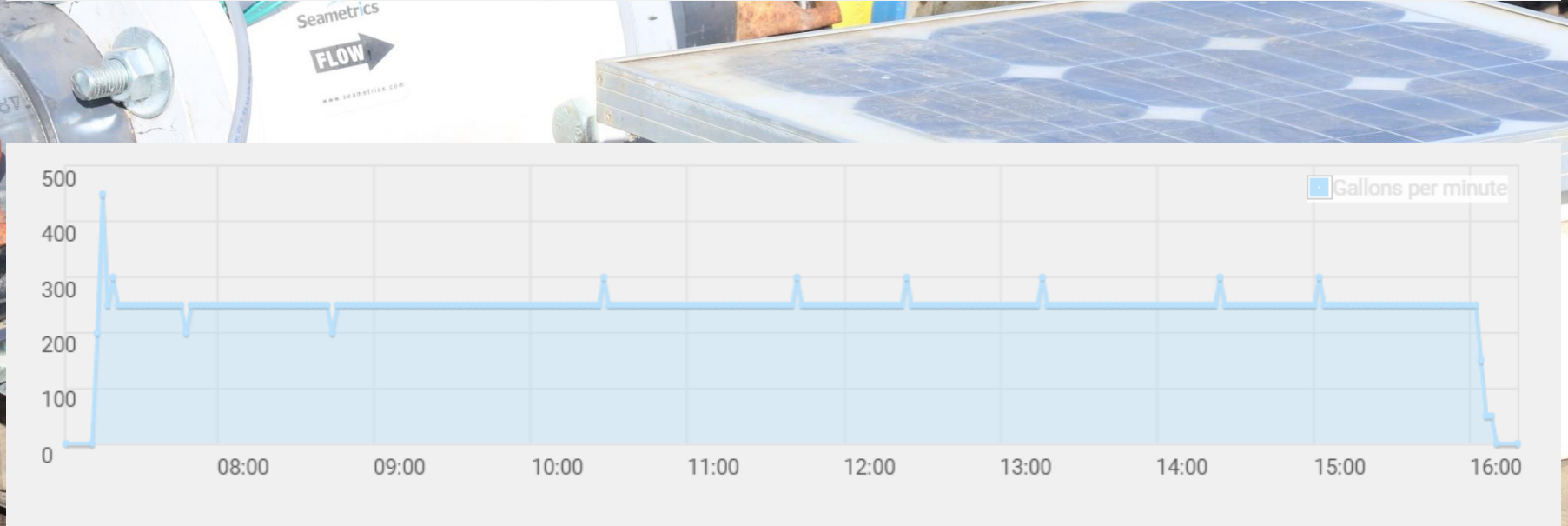
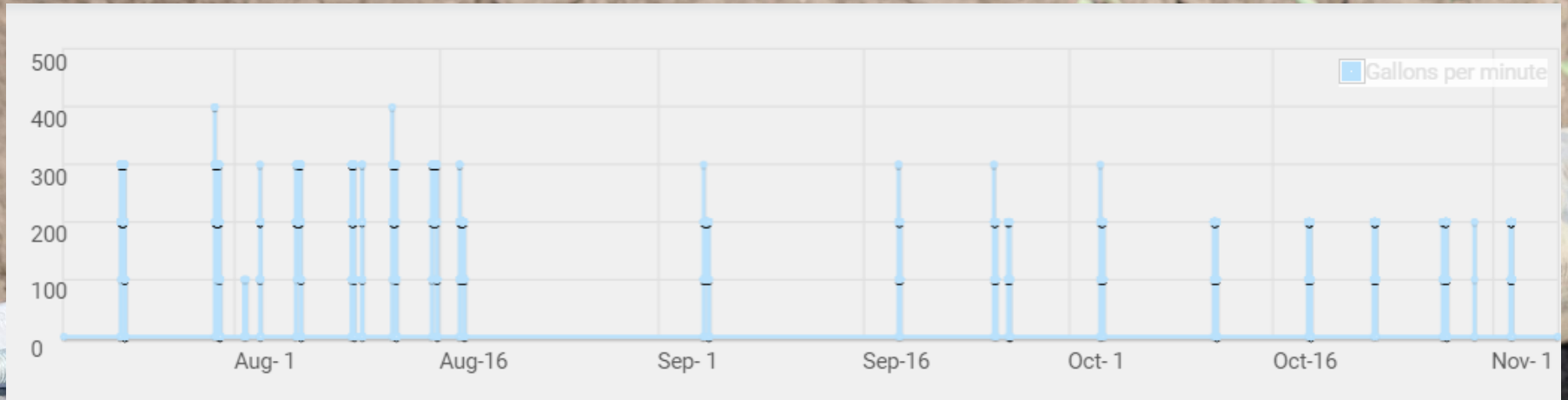
Canopy B ⓘ

-9.63

-9.63



# CropManage can be used to monitor irrigation practices





# Soil moisture monitoring



# How to learn more:



- Attend a CropManage Workshop
- Targeted trainings
- Help links and comments
- CropManage hotline 831-759-7377