Using CropManage online tool for irrigation decision support of alfalfa

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:

\[ \text{ET}_{\text{crop}} = \text{ET}_{\text{ref}} \times K_{\text{crop}} \]

\(K_c\) can vary from 0.1 to 1.2
Harvest affects the crop coefficient (Kc) of alfalfa
Other information needs to be considered

**Rooting depth**

![Rooting depth diagram](image)

**Irrigation System Uniformity and Application Rate**

![Irrigation system image](image)

**Soil Type**

![Soil type map](image)

**Salinity of Water Source**

![Salinity image](image)
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

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Sep 2020</td>
<td>Sprinkler</td>
<td>8 hr</td>
</tr>
<tr>
<td>29 Aug 2020</td>
<td>Cutting</td>
<td>34 days</td>
</tr>
<tr>
<td>25 Aug 2020</td>
<td>Sprinkler</td>
<td>4 hr</td>
</tr>
<tr>
<td>20 Aug 2020</td>
<td>Sprinkler</td>
<td>7 hr</td>
</tr>
</tbody>
</table>
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
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

10/08/2020

Irrigation Method
Sprinkler

Recommendations

Recommended Amount
7.13 hours

Recommendation Summary

Water Applied

Recommandations

Recommended Amount
7.13 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% x 0.00)) - 0.00 in.
CropManage interfaces with Satellite Irrigation Management Support (SIMS)
Satellite data can be used to confirm canopy development model.
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