CropManage Hands-on Workshop

Internet connection:
  Wifi Network: ABBOTT-CONF-GUEST
  Wifi key: 1428AGGUEST
Certified Crop Adviser Continuing Education Units (CEU)

**Location:** Monterey County Agricultural Conference Room

**City, State:** Salinas, CA

**Tracking Number:** CA 53229

**Date:** 2015-04-02 09:00 AM - 12:00 PM

**Approved CEUs:**

- Nutrient Management: 1
- Soil & Water Management: 1
- Professional Development: 0.5
Acknowledgements:

Richard Smith and Tim Hartz
UC ANR programming staff (Bryon Noel, Dave Krause, Marcelo Gachet)
CDFA-Fertilizer Research Education Program
CA Dept of Water Resources
UC Division of Agriculture and Natural Resources
Monterey Co. RCD
Growers and Shippers

Thank you to Wilbur Ellis Co. for Sponsoring Refreshments!
CropManage Hands on Workshop

8:30 – 9:00 Registration and Refreshments
9:00 – 9:30 Introduction
9:30-10:15 Getting started (Setting up ranches and plantings)
10:15 (Break)
10:30 – 11:15 Using CropManage for decision support and record keeping
11:15- 11:45 Navigating around and advanced features
11:45-12:00 Discussion of new features or changes needed (Bryon Noel).
Tools for Managing Water and Nitrogen Fertilizer in Vegetables

- Soil nitrate quick test
- Weather-based irrigation scheduling
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
Other information needs to be considered

Rooting Depth

Irrigation System Uniformity and Application Rate

Soil Type

Salinity of Water Source
Web-based Irrigation and N management software for lettuce

https://ucanr.edu/cropmanage
Integrate information from multiple sources

Crop ET model → Watering Recommendation

Crop N model → N fertilizer Recommendation

Display and export water and fertilizer records

Decision support using crop models

Database driven web application

Soil and Ranch

CIMIS ETo

Soil nitrate test

Field sensors
Current crops supported

Vegetables:
- Romaine (40 and 80-inch wide beds)
- Iceberg (40 and 80-inch wide beds)
- Broccoli (summer and winter plantings)
- Cauliflower (summer and winter plantings)
- Cabbage (red and green)
- Spinach*
- Celery*
- Onions*

Berries:
- Strawberry
- Raspberry*
- Blackberry*
UC Security and Privacy Policy

1. CropManage is designed to protect the privacy of grower data.
2. Current industry security standards are used (backed up to 2 other servers, encryption, secure security socket layer).
3. UC does not give out/sell grower data and is not obligated to give out data.
4. UC will not analyze grower data without first asking for permission.
How is N fertilizer rate determined from the quick nitrate test?

Recommended
Fertilizer N = Future Crop N uptake

– (Quick Test N - threshold NO$_3$-N)

– Soil mineralization N

– Plant residue N

– N in irrigation water
N uptake rate by head lettuce
(40 inch-wide beds)
Nitrogen Fertilizer Recommendation

N uptake curve

N uptake = 57 lbs/acre

Irrigation water = 5 lbs/acre

Soil and residue mineralization = 4.5 lbs/acre

N fert = 57 + 18 - 4.5 - 5 = 66 lbs N /acre

Soil NO₃-N threshold

SNQT - Threshold = -18 lbs/acre
Spatial CIMIS ETo Reporting
How much water was applied?
Evaluate and Document Water Management
Soil moisture monitoring
Tensiometer readings recorded on Campbell Scientific 206 logger
Summary of Commercial Lettuce Strip Trials (2012-2013)

33% (57 lbs N/Ac) less N applied following CropManage
Using weather based irrigation scheduling for broccoli

<table>
<thead>
<tr>
<th>Irrigation Treatment</th>
<th>Applied water</th>
<th>Marketable Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inches</td>
<td>Crown</td>
</tr>
<tr>
<td>Grower Standard (150% ET)</td>
<td>20.4 inches</td>
<td>6797</td>
</tr>
<tr>
<td>CropManage (100% ET)</td>
<td>14.2 inches</td>
<td>6747</td>
</tr>
<tr>
<td>LSD&lt;sub&gt;0.05&lt;/sub&gt;</td>
<td>NS</td>
<td>1052</td>
</tr>
</tbody>
</table>
Irrigation Effects on Marketable Fruit Yield (Strawberry)

<table>
<thead>
<tr>
<th>Irrigation Treatment</th>
<th>Marketable Fruit Yield (lbs x 1000/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% ETc</td>
<td>14.2 in</td>
</tr>
<tr>
<td>75% ETc</td>
<td>b</td>
</tr>
<tr>
<td>100% ETc</td>
<td>20.4 in c</td>
</tr>
<tr>
<td>150% ETc</td>
<td>27.3 in c</td>
</tr>
<tr>
<td>Grower</td>
<td>31.4 in c</td>
</tr>
<tr>
<td></td>
<td>39.1 in c</td>
</tr>
</tbody>
</table>
The road ahead...
New version of CropManage under development

- Dedicated programmers for CM
- Better user-interface
- Faster speed
- More flexibility to support different types of commodities
Opportunities to partner with commercial companies by developing CM into a web service (API):

Steinbeck Country Produce, Inc.

EKMETRICS

Ranch Systems LLC

SureHarvest

gThrive
N contribution from irrigation water?
Summary

- Web applications can be useful for repackaging research results into simple to use decision support tools.

- *CropManage* is designed to help growers improve water and N management and for assisting with research/demonstration trials.

- Opportunities exist for expanding CM to additional commodities and adding in new features and data sources.
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