Surveying the need for an electronic decision support tool for irrigation and nutrient management

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CropManage

An online decision support tool for irrigation and fertilization

Integrates information from multiple sources

Database Driven Web Application

Crop ET model → Watering Recommendation

Crop N model → N fertilizer Recommendation

Display and export water and fertilizer records

Mike Cahn, UCCE Monterey County

Steps to Using CropManage

1. Establish User Login
2. Assign to Ranch or start New Ranch
3. View Planting within Ranch or Add New Planting
4. View or enter soil tests, fertilizer, or irrigation events

Current crops supported

Vegetables:
- Romaine lettuce
- Iceberg lettuce
- Broccoli
- Cauliflower
- Cabbage
- Spinach*
- Celery*
- Onions*

Berries:
- Strawberry
- Raspberry*
- Blackberry*

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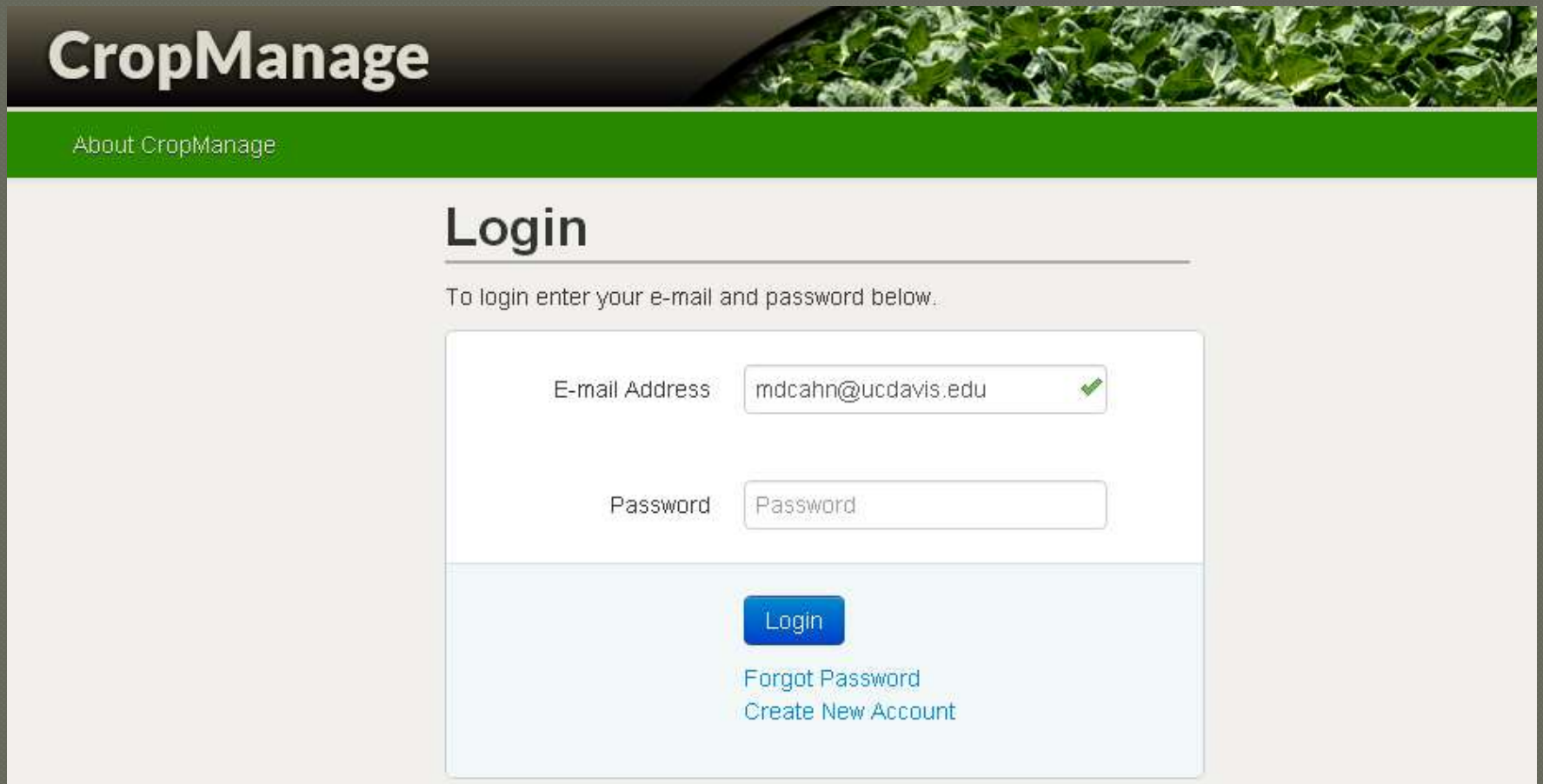
Web-based Irrigation and N management software for lettuce

https://ucanr.edu/cropmanage



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Fertilizer Summary

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Fertilizer Date	Soil NO_3-N (ppm)	Crop Stage	Fertilizer N Recommended (lb N/acre)	Cumulative N Uptake	Fertilizer	Applied N (lb N/acre)	Applied Fertilizer
7/1/12	12.50	Planting	0.0	0.23	3.5-12-14	15.0	36.9 gal/acre
7/24/12	15.00	1st drip fertigation	31.2	4.32	28-0-0-5	24.8	8.0 gal/acre
8/10/12	15.00	2nd drip fertigation	55.8	31.90	UAN28	56.7	19.0 gal/acre
Totals			86.9			96.5	

New Fertilizing

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Irrigation Summary

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Water Date	Irrigation Method	Recommended Irrigation Interval (days)	Recommended Irrigation Amount (inches)	Recommended Irrigation Time (hours)	Irrigation Water Applied (inches)	Kc	Canopy Cover (%)	Average Reference ET (inches/day)	Total Crop ET (inches)
7/8/12	Sprinkler	1.6	0.48 in	1.59 hrs	0.60 in	0.48	0	0.25	0.36
7/13/12	Sprinkler	2.8	0.47 in	1.57 hrs	0.51 in	0.30	1	0.24	0.35
7/20/12	Drip	6.3	0.41 in	2.70 hrs	0.45 in	0.23	3	0.22	0.34
7/24/12	Drip	9.4	0.19 in	1.25 hrs	0.22 in	0.16	5	0.25	0.16
7/29/12	Drip	11.2	0.23 in	1.56 hrs	0.15 in	0.18	11	0.22	0.20
8/4/12	Drip	8.2	0.46 in	3.03 hrs	0.60 in	0.27	24	0.24	0.39
8/7/12	Drip	7.6	0.26 in	1.76 hrs	0.30 in	0.40	33	0.19	0.22
8/10/12	Drip	4.9	0.44 in	2.95 hrs	0.30 in	0.50	43	0.25	0.38
8/14/12	Drip	4.3	0.73 in	4.90 hrs	0.80 in	0.64	56	0.25	0.62
8/18/12	Drip	4.1	0.82 in	5.49 hrs	0.00 in	0.77	67	0.23	0.70
Totals			5.36 in	29.70 hrs	6.03 in				4.38 in

New Watering | View Rainfall Data

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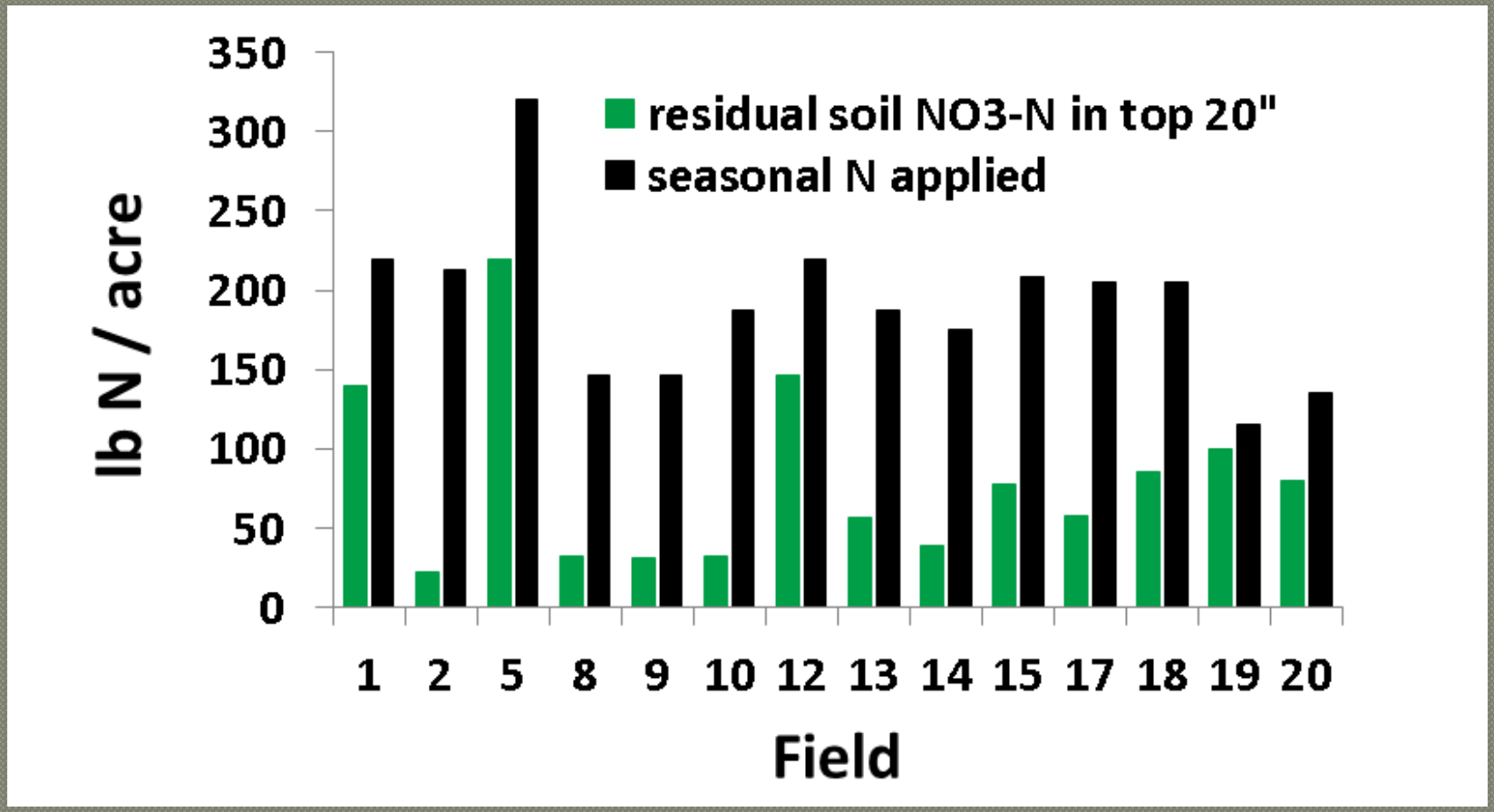
Clientele interest

Fertilizer application vs. preplant soil residual NO_3-N



- Soil residual NO_3-N varied 23 to 219 lb, avg 80 lb
- N application ranged 115 to 320 lb, avg 190 lb

Data from Horwath et al., 2013

Summary

- Web applications can be useful for repackaging research results into simple to use decision support tools
- CropManage is helping lettuce growers improve water and N management on field-by-field basis and document their practices
- Opportunities to expand CM to additional commodities and adding in new features and data sources
- Would a "CropManage" approach be helpful for growing processing tomatoes?

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What is your main relationship to the agriculture industry?

A. Grower
B. Farm manager/foreman
C. PCA or CCA
D. Other

How do you prefer to receive information from UCCE?

Enter top choice, then 2nd, 3rd and 4th choices

A. Personal contact (field visits, phone calls)
B. UCCE meetings
C. Printed form (print newsletter, print publications)
D. Online (blogs, websites, e-publications)

Which aspects of a decision support tool would be most valuable to you ? Select all that apply

A. Irrigation Management
B. Nitrogen Management
C. Recordkeeping for reporting
D. I don't need a computer based tool

How much time would you be willing to spend each week to update a decision support tool? (time per field)

A. Less than 10 minutes
B. 10 to 20 minutes
C. 20 to 30 minutes
D. More than 30 minutes

How much money would you be willing to spend each year on soil and plant tissue sampling (per field)?

A. Less than $100
B. $100 to $200
C. More than $200

How often are fields sampled for complete soil testing?

A. Never
B. Every few years
C. Every year in some fields
D. Every year in every field
E. When problems are detected

How often are fields sampled for soil nitrate testing?

A. Never
B. Every few years
C. Every year in some fields
D. Every year in every field
E. When problems are detected

How often are tissue samples taken?

A. Never
B. Every few years
C. Every year in some fields
D. Every year in every field
E. When problems are detected

What are your irrigation decisions currently based on? Select all that apply

A. Personal experience
B. UC Guidelines
C. Recomendation by a consultant/PCA/CCA
D. Soil moisture sensors
E. Other

What are your nitrogen fertilization decisions currently based on? Select all that apply

A. Personal experience
B. UC Guidelines
C. Recomendation by a consultant/PCA/CCA
D. Soil tests
E. Plant tissue analyses
F. Nitrate in irrigation water

Thank you very much for taking the time!