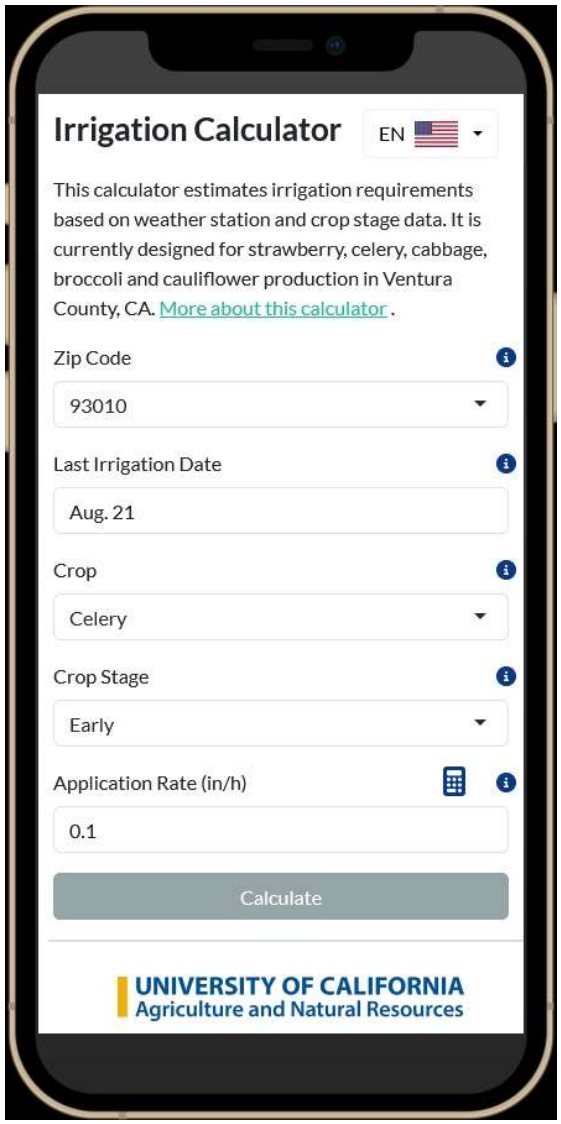


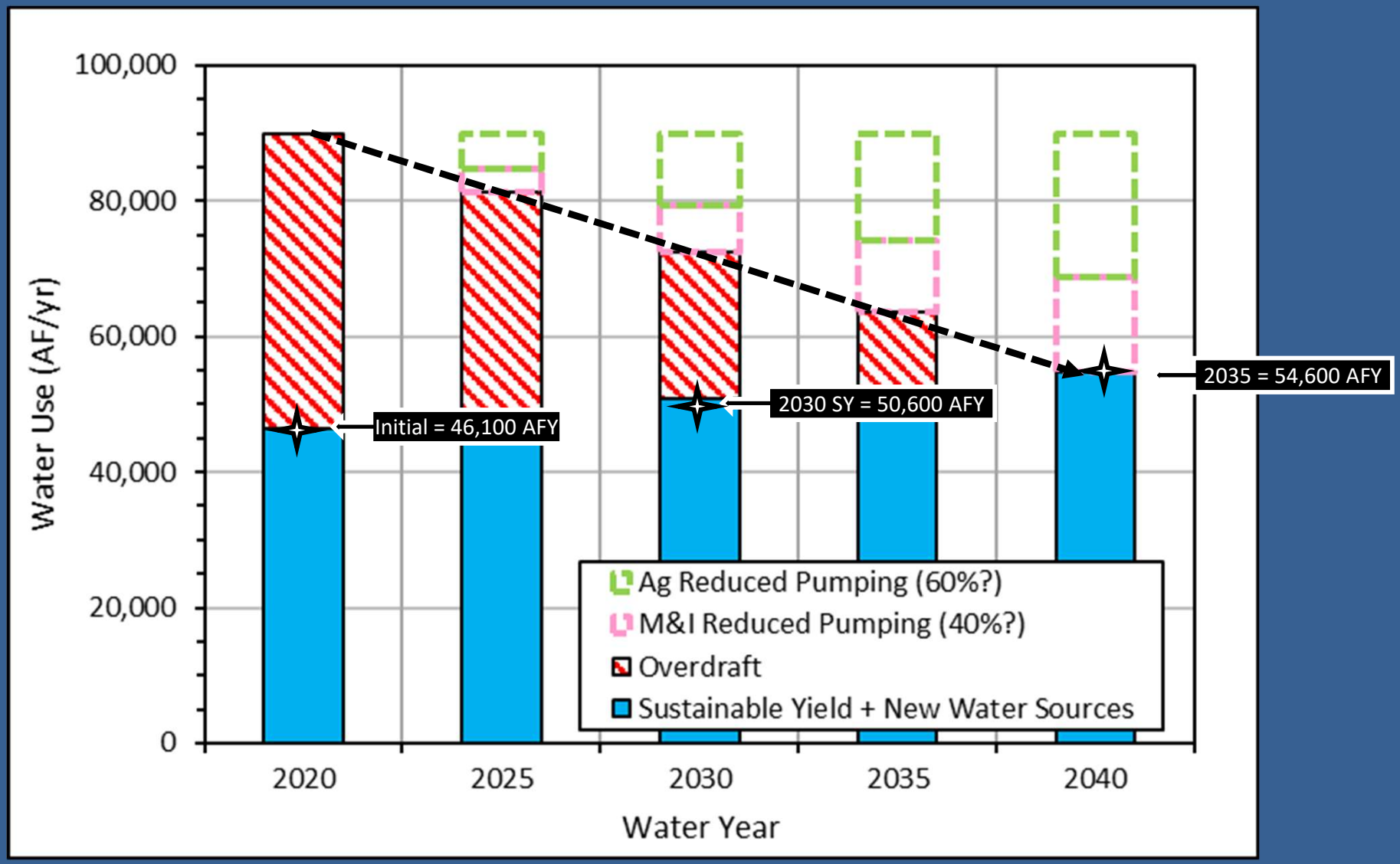
Developing of an Irrigation App to Increase Data-Driven Decisions for Optimal Water Use

Andre Biscaro,
Irrigation and Water Resources Advisor
University of California Cooperative Extension

Andy Lyons,
IGIS, UC ANR

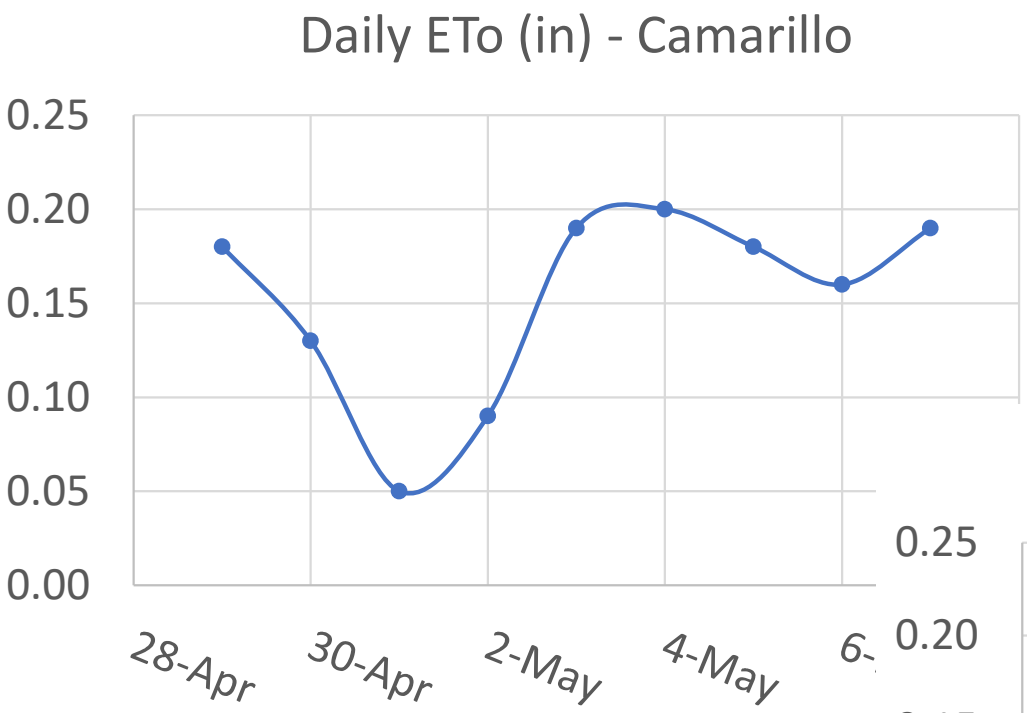
University of California
Agriculture and Natural Resources

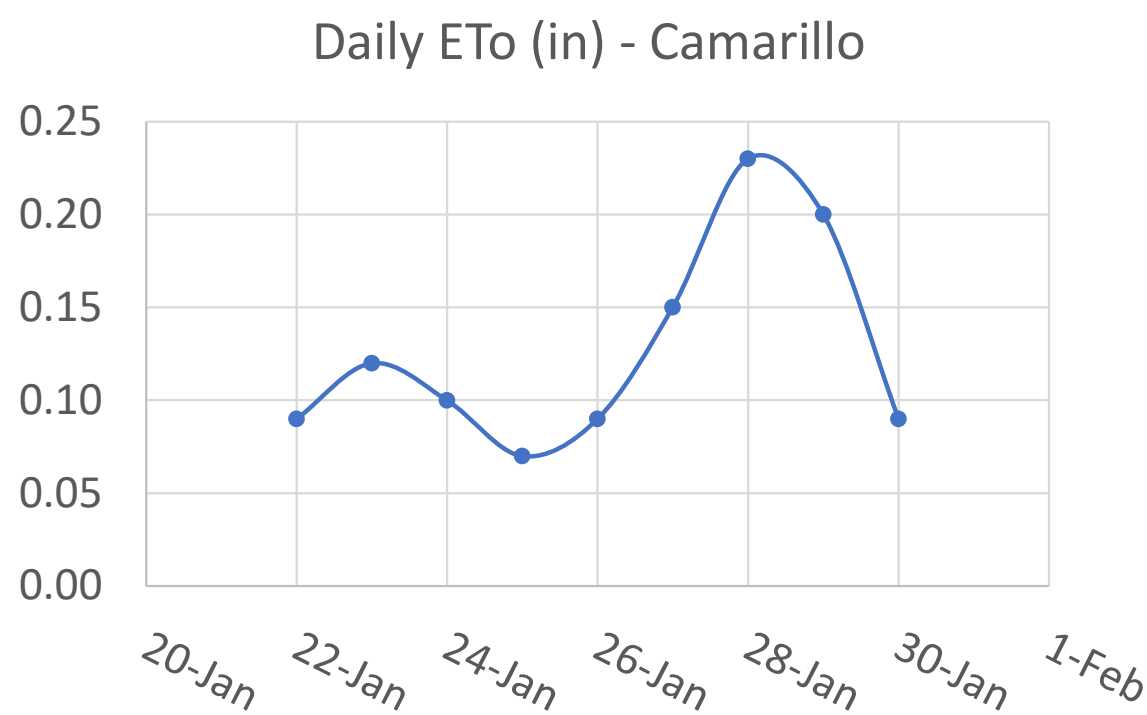
Path to Sustainable Yield with Current GSP Projects



(Courtesy of Dan Detmer, 2021)

Why is irrigation scheduling challenging?

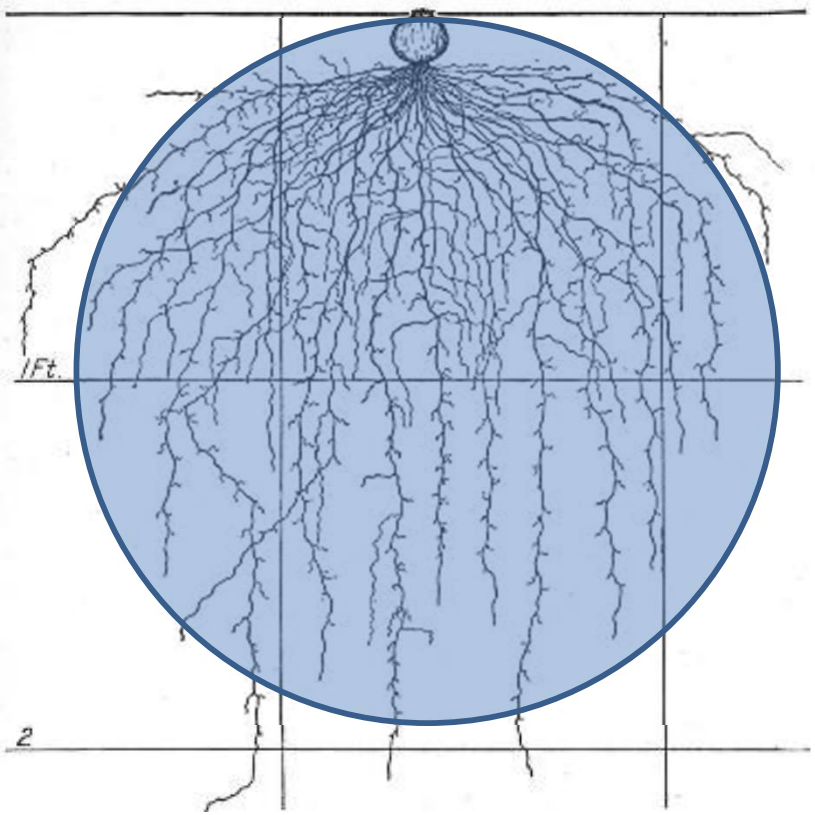


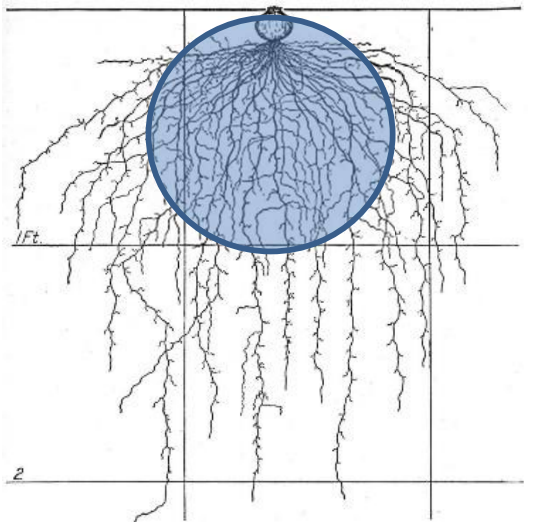


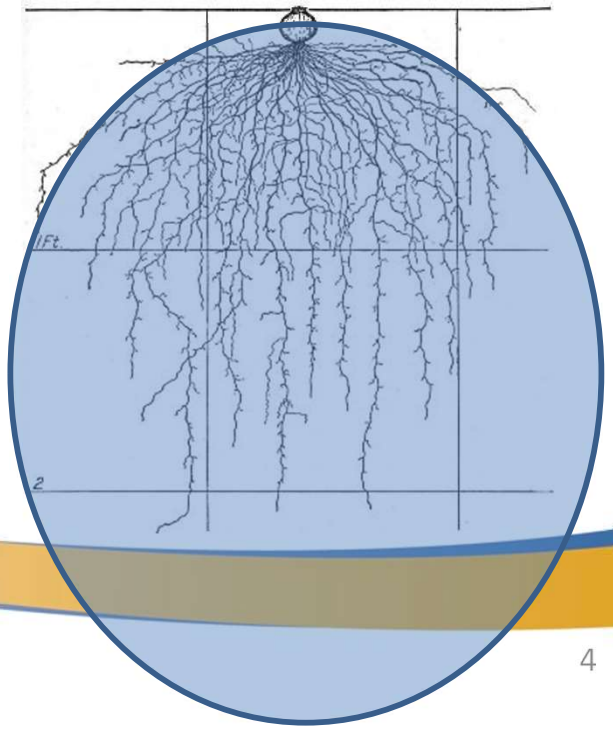
University of California
Agriculture and Natural Resources

Inefficient irrigation

Ideal irrigation





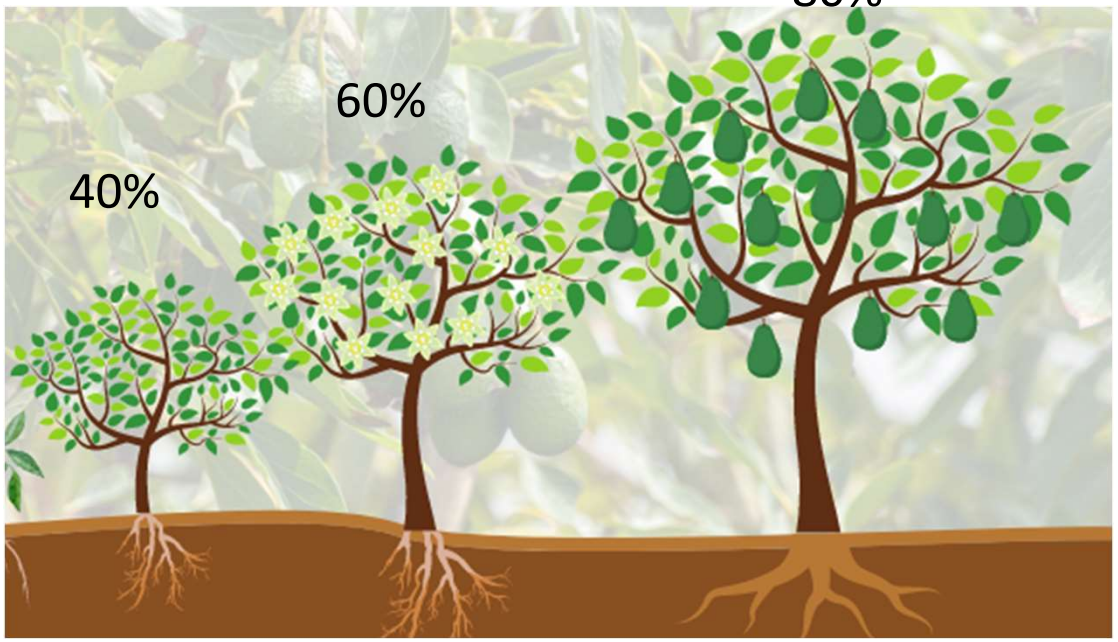


ET-Based Irrigation

ETo

x

Kc (varies with different canopy cover)



Water Recommen-dation

Basic equation: ETc = ETo * Kc

ETc = Crop evapotranspiration
ETo = Reference evapotranspiration
Kc = Crop coefficient

Accounting for distribution uniformity and leaching fraction:
ETc = ((ETo * Kc)/(DU/100))/(1-LF/100)

DU = Distribution uniformity
LF = Leaching fraction

Example:

Kc = 0.2 Kc = 0.8

Last irrigation on May 27

Date	ETo (in)
5/28/24	0.14
5/29/24	0.10
5/30/24	0.15
5/31/24	0.14
6/1/24	0.05
6/2/24	0.06
6/3/24	0.13

Total ETo = 0.77 in

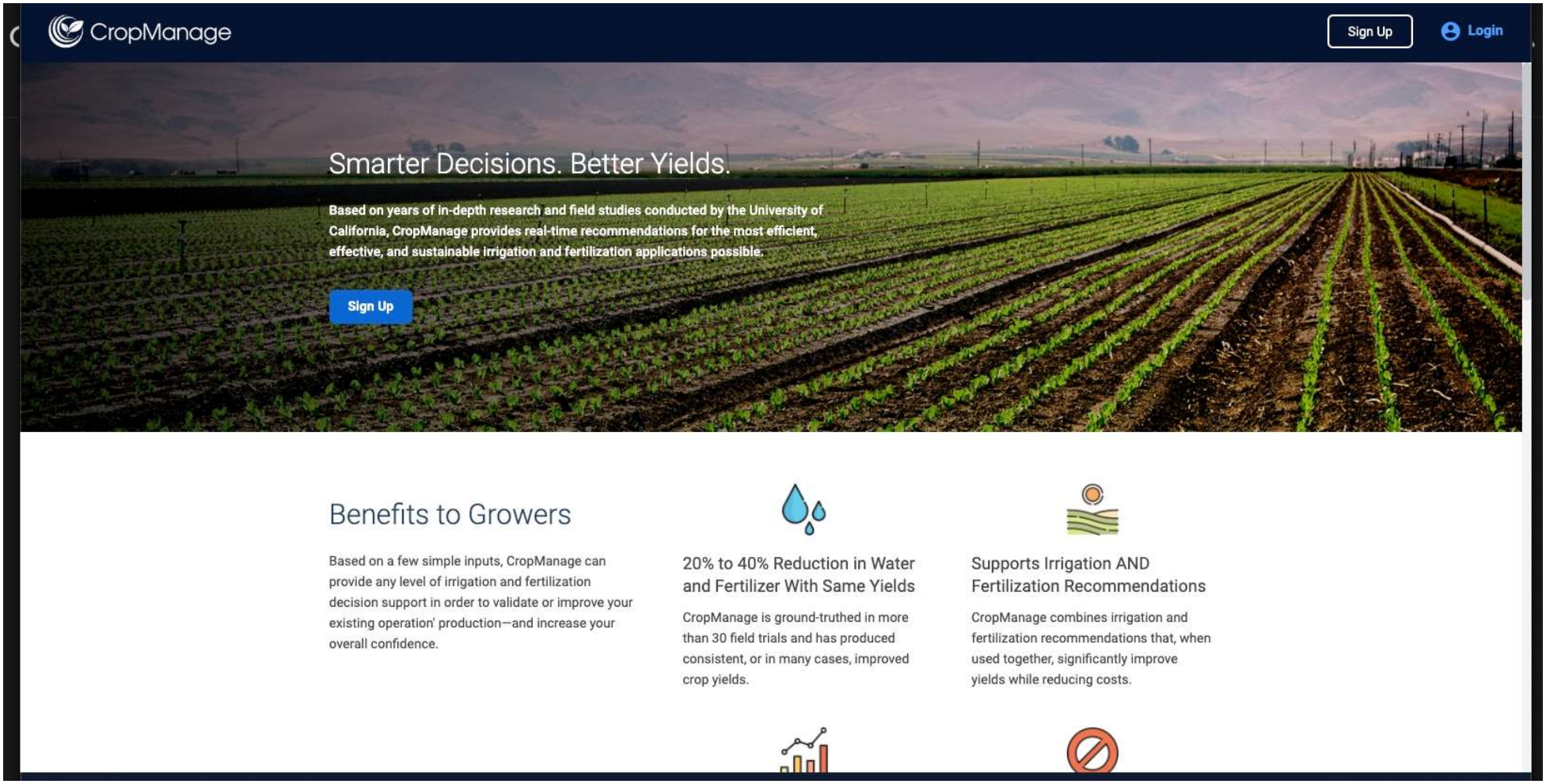
Young orchard:
ETc = 0.77*0.2 = 0.15 in

Mature orchard:
ETc = 0.77*0.8 = 0.62 in

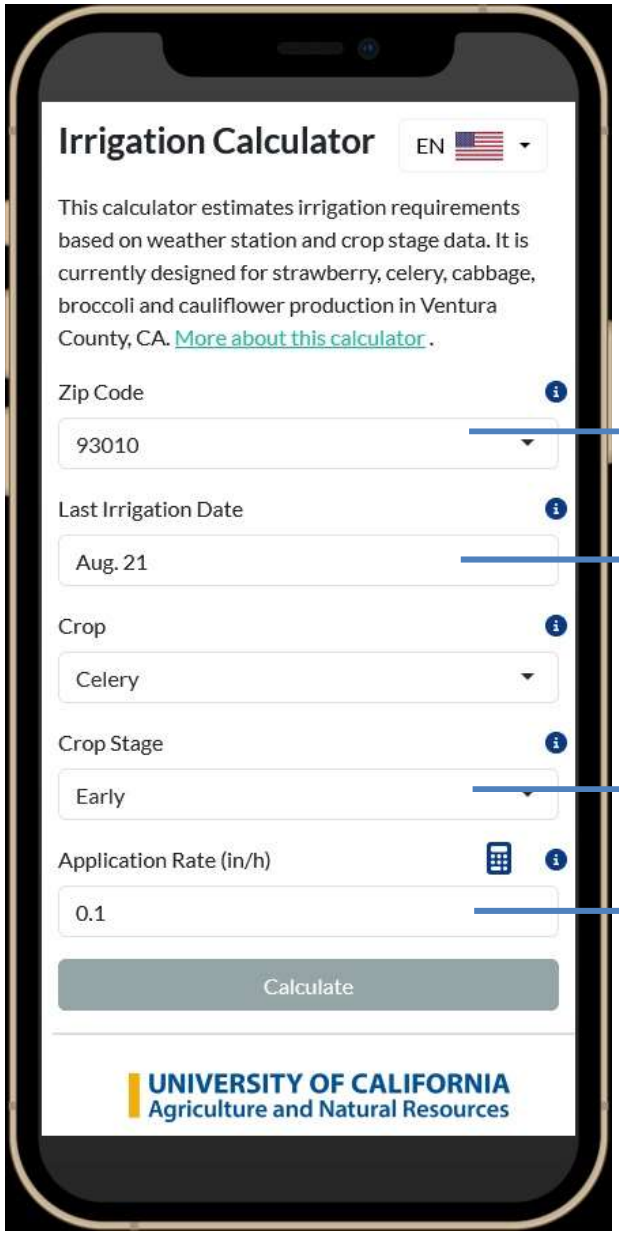
DU= 80%
LF = 10%

ETc = ((0.15)/0.8)/0.9
= 0.21 in

ETc = ((0.77)/0.8)/0.9
= 0.86 in



https://cropmanage.ucanr.edu/



Chooses the weather station

Collects reference evapotranspiration data since last irrigation

Adjusts the crop coefficient

Converts volume to time

- ✓ Distribution Uniformity: 85%
- ✓ Leaching Fraction: 10%

Summary

- ✓ Currently beta-testing at celery commercial fields (Duda and Deardorff Family Farms)
- ✓ Avocado Commission grant; beta-testing coming soon.
- ✓ Anticipated outcomes:
  - Increased adoption of data-driven management
  - Improved water use efficiency

Ventura County ETo Stations

University of California
Agriculture and Natural Resources