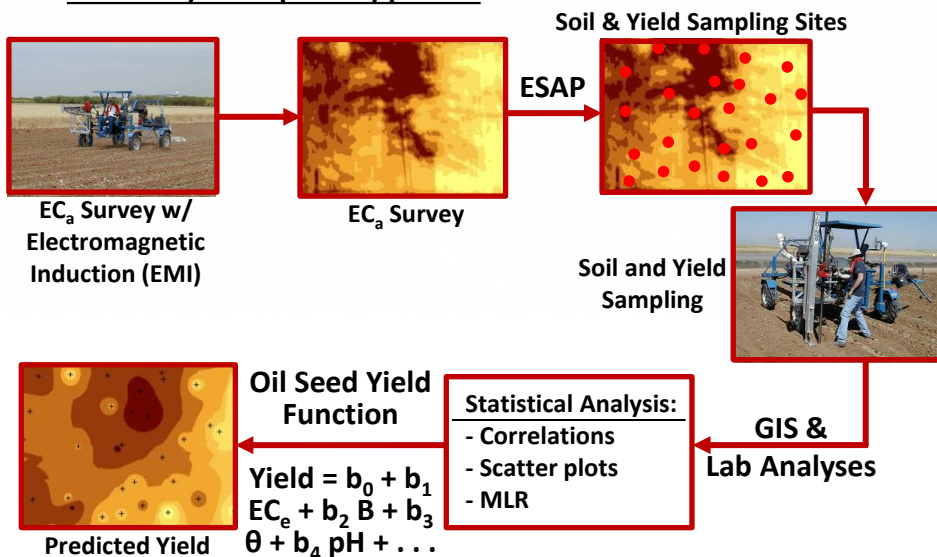


OBJECTIVE: Model the edaphic effects on mustard oil seed yield for saline-sodic soils in the San Joaquin Valley

Description

- Description of Problem:** 1) Develop a model for ALMANAC predicting mustard oil seed yield from soil-related properties for marginally productive saline-sodic soils of the west side of the San Joaquin Valley (WSJV). 2) Predict biofuel production for WSJV.
- Technical/conceptual approach:**



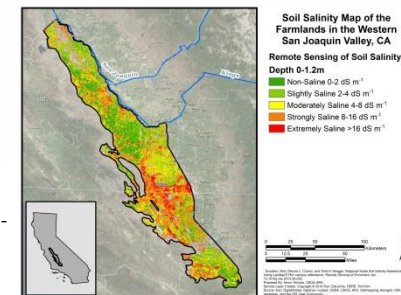
Key Accomplishments & Findings

- FY 2014 deliverable: Mustard oil seed yield function/model**

$$\text{Oil Seed Yield (g/m}^2\text{)} = 31.22 \text{ Boron} - 1.83 \text{ Boron}^2 - 14.11 \text{ Salinity} + 0.61 \text{ Salinity}^2 - 130.1 \text{ Leaching Fraction} + 319.8 \text{ Water Content}$$

$$R^2 = 0.89$$
- 2014 Finding:** Salinity threshold=7.3 dS/m, slope % per dS/m=20, B tolerance=3 to 8 ppm
- 2014 Finding - Evaluation of SSURGO:** SSURGO salinity database evaluated to be inaccurate and inadequate for salinity.
- 2015 Finding - Salinity map WSJV:**

$$^{\dagger}\text{Salinity} = \alpha_0 + \alpha_1 \text{CRSI} + \alpha_2 \text{rainfall} + \alpha_3 \text{temperature}$$
 where CRSI = canopy reflectance salinity index.
[†] Scudero, E., T.H. Skaggs, and D.L. Corwin (2015). Regional-scale soil salinity assessment using Landsat ETM+canopy reflectance. Remote Sens. Environ. 169:335-343.
- FY 2015 deliverable – Predicted biofuel production from oil seed:**
 WSJV only = 2.9-19 million gal./yr.
 entire SJV = 7.2-47.9 million gal./yr.



Tools & Methods

- Primary tasks performed (FY2014):**
 - Developed a oil seed yield model and salt tolerance model
 - Statistically evaluated SSURGO and Landsat 7 salinity indices
- Primary tasks performed in (FY2015):**
 - Developed a soil salinity model based on Landsat 7 imagery and EC_a-directed soil sampling data
 - Predicted biofuel production for WSJV and entire SJV

Project Management Information

- FY2014 Funding:** Balance of funds by Sept. 30, 2014 will be \$40K in a NAL account, which will be used in FY2015 to support 2 techs until Dec. 31, 2014.
- FY2015 Funding:** No new funds.

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