

Gap Analysis

Western SARE Grant

Introduction

Growers on California's Central Coast expressed the need for technical assistance in implementing irrigation and nutrient efficiency as a top priority for supporting sustainable agriculture and addressing mounting water quantity and water quality concerns in our region. An online clearing house of INM tools was completed and an Expert Advisory Panel was formed. Based on the work to date, this gap analysis was developed.

Objectives

The Western SARE project Gap Analysis has the following objectives:

- 1) Assess what tools and instructional materials are missing
- 2) Determine additional professional training
- 3) Select preferred delivery mechanisms

Summary of Toolkits Available for Irrigation and Nutrient Management

The toolkits are found at the Agriculture Water Quality Alliance web site under the "toolkits" tab. The toolkits directory is divided as follows:

- 1) Irrigation Assessment
 - a. Why do an assessment
 - b. Assessment
 - c. Report
 - d. Follow up consultation
 - e. Implementation
 - f. Verification
 - g. References
 - h. Calculators/data sheets
- 2) Irrigation Scheduling
 - a. Overview of methods
 - b. All-in-one system
 - c. Determining the size of your soil reservoir
 - d. Determining Management Allowable Depletion
 - e. Determining actual depletion: soil moisture measurement
 - f. Evaporation based irrigation management
 - g. Salt leaching requirement
 - h. Factoring in irrigation efficiency
 - i. References
- 3) Nutrient Management
 - a. Guide to resources

- b. Online fertilizers application calculations and guidance
- c. Tracking, budgeting, calculating
- d. Procedures (nutrient guides, plant nitrate, soil nitrate, quick test)
- e. Information

Assessment of Instructional Material and Tools Gap Analysis

After reviewing the information collected and organized in the toolkits tables, we have the following observations:

- Resources for professionals seem very comprehensive
- The Irrigation assessment tool presents complete lists of standard operating procedures (SOP) for the University of California Cooperative Extension (UCCE) assessment method. However, no SOP was presented for the Irrigation Training and Research Center (ITRC) method. Also, no discussion on the difference between the methods is presented in the list of document. The ITRC method or a modified or simplified ITRC method is used by most of the California Resource Conservation Districts (RCDs) and Irrigation Districts Mobile Irrigation Labs (MIL).
- Even though the SOP materials and instructions are perfectly easy to follow for most RCD staffers with a general science background, the gap is in their ability to analyze the results and provide sound technical recommendations to the farmer that the staffers can describe/discuss/support with further in-person consultation. That ability only comes with adequate training and experience, which is beyond the scope of this project.
- Irrigation scheduling, which specifies when to irrigate and how much water to apply, requires knowledge of the crop, soil, weather, and farm management factors. Sensors are used to help the growers schedule irrigations. Usefulness of the sensors varies by site and experience of the professional.

Professional Training Gap Analysis

- While there is an apparent gap in terms of professionals available to provide unbiased Irrigation and Nutrient Management (INM) assistance to growers in the region, that appears to us to be more an issue of numbers of available professionals lacking institutional bias (e.g., independent PCA's and CCA's) rather than that of accessible information for those professionals. The source of the gap in numbers of available professionals is reflective of an apparently small market of interest in the information, a market driven by Return-on-Investment and Regulatory mandates.
- Implementing the Nutrient Management tools requires a different professional background than that required to implement Irrigation Assessment and Scheduling.

- The gap that we are most concerned with (but which likely falls outside this project's scope) is that of information accessibility and/or usefulness to the farm managers that oversee or make irrigation and nutrient management decisions on individual farms; availability of information and training that would enable them to make better decisions and/or track the right information to guide those decisions. These field managers need information in a different format (less technical, more step-by-step descriptions, etc.) than the resources that have been compiled under the Western SARE project.
- We conducted our review with the shared conviction that a gap that this project can't and shouldn't fill is the gap in training needed by RCD staff to achieve competency as technical resources if they do not come to their positions with the appropriate technical education or experience. This is a matter of personnel management rather than a professional development issue.

Delivery Mechanism

- We recommend that any training must have a hands-on component, where the professional is involved in the application of the tools.