Training on Crop Management that Integrates Climate, Soil and Irrigation System Data to Minimize Nutrient Loss and Optimize Irrigation Efficiency

Project Leader: Trina Walley
East Stanislaus Resource Conservation District
(209) 491-9320, programs@eaststanrcd.org

Abstract
The Management, Assessment and Training (MAT) program will address and alleviate a knowledge gap in the Central Valley through: Training, Evaluation, Certification, and Outreach. Trainings will include Soil Health, Nutrient Management, Irrigation Water Management and Irrigation Evaluation Methods. The trainings will be provided in both English and Spanish to reach operators at all levels including landowners, field managers, and crop advisors. The MAT evaluation process will provide an in-field system and site evaluation for each of the growers who choose to utilize the evaluation service. The evaluations will consist of system efficiency test to determine distribution uniformity and identify maintenance issues, a graphical soil assessment of micro and macro nutrients, and discussion about current operational practices. These evaluations will identify areas where best management practices could be fine-tuned and lead to some implementation options to increase operational efficiency. A full conservation plan will be developed based on the landowner’s desire to address the most pressing water, soil and nutrient management practices that can be used to seek additional technical assistance.

Project Objectives

1. Promote best management practices through workshops for agricultural workers in English and Spanish based on existing resources from University of California Cooperative Extension, USDA-Natural Resource Conservation Services, NCAT/ATTRA and CDFA-FREP.

2. Establish training materials and workshops that can be approved for continuing education credits towards maintaining certifications through Irrigation Association, California Certified Crop Advisors and Department of Pesticide Regulation.

3. Encourage irrigators to share individual challenges and successes in workshops, which will create a networking environment for ongoing farmer-to-farmer education.
Evaluation of Nitrogen Uptake and Applied Irrigation Water in Asian Vegetables Bok Choy, Edible Chrysanthemum, Garlic Chives, Moringa, and Lemongrass

Project Leader: Aparna Gazula
University of California Cooperative Extension, Santa Clara County
(408) 282-3127, agazula@ucanr.edu

Abstract

Grown primarily in Fresno, Monterey, Riverside, San Bernardino, Santa Clara, San Luis Obispo, and Ventura counties on around 7,026 acres, Asian vegetables are valued at $79 million per year. Asian growers producing specialty vegetables and herbs are required to fill out the nitrogen management plan as part of the ILRP. However, they lack the information to complete this form accurately as there is no information on nitrogen fertilizer recommendations or nitrogen uptake for most of their crops. The project proposes to provide detailed measurements of total N uptake and N uptake pattern of bok choy, edible chrysanthemum, garlic chives, moringa, and lemongrass. This project will also evaluate current irrigation management practices of these crops and compare them with the crops’ water requirements and identify potential practices that may help reduce nitrate leaching. Together, the information collected will provide the basic information necessary for growers to better manage N inputs to these crops and protect water quality.

Project Objectives

1. Evaluate N uptake, N availability, canopy development and water application of bok choy, edible chrysanthemum, garlic chives, moringa, and lemongrass.

2. Extend the findings of this research to Chinese and Hmong growers in the Central Coast and Central Valley regions to increase their understanding of N uptake and publish results to provide documentation of the findings.
A System Nitrogen Balance for Container Plant Production

Project Leader: Lorence Oki
University of California Cooperative Extension, Landscape Horticulture
(530) 754-4135, lroki@ucdavis.edu

Abstract

Nursery production is the 3rd largest crop commodity in California with 2014 sales of $3.22 billion (CDFA 2016) and container grown plants account for 68% of 2012 total sales in this category (USDA 2014). The results of this research will provide economic, environmental, regulatory, and horticultural benefits by educating growers in N utilization and loss mechanisms within container plant production. After environmentally harmful N losses are identified, N mitigation strategies will be developed to reduce their environmental impact by reducing, recovering, or preventing N discharge. With a greater understanding of the fate of applied N in container plant production optimal mitigation strategies can be implemented that result in the best possible nitrogen use efficiency. Implementation of these strategies will help reduce nitrate leaching into groundwater and could improve water quality for future generations in many Central Valley communities. Deliverables include an improved understanding of N cycling, BMPs to improve NUE, and the cost of those BMPs in container plant production. This information will be conveyed to growers via outreach materials, including presentations at workshops and articles in trade and academic journals.

Project Objectives

1. Develop system nitrogen balance for container plant production.
   a. Determine the mechanisms and pathways of nitrogen (N) loss from container plant nurseries in California.
   b. Use the results from this study to help influence a nursery specific N management plan.

2. Test strategies that mitigate environmentally harmful N losses from nursery production systems.
   a. Use the information on N mitigation strategies to help growers increase N use efficiency, thereby resulting in decreased costs and increased profitability.

3. Economic analysis for BMPs and mitigation strategies.

4. Extend research results to industry, regulators, and scientific community