

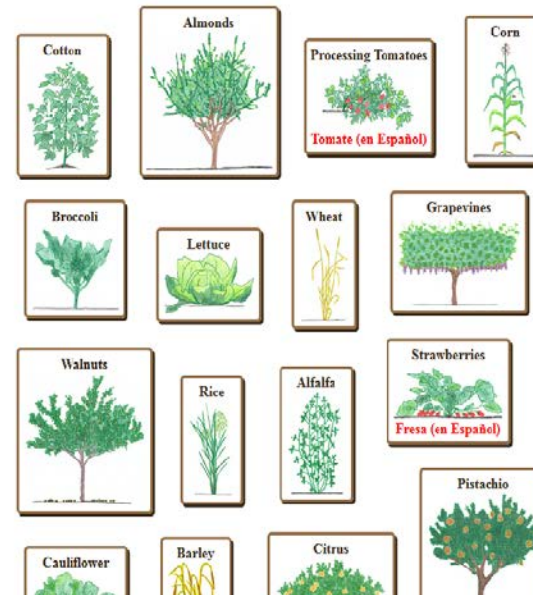
CROSS TRAINING ON IRRIGATION AND NUTRIENT MANAGEMENT TOOLS



Fertilization Guidelines for Major Crops Grown in California

These guidelines are based on research results from studies carried out in California and elsewhere. For an optimal fertilization program, site-specific information needs to be taken into account. A discussion about site-specific adjustments can be found [here](#).

After choosing a crop from the list below, detailed information can be accessed by moving the mouse over any shape with the symbol ⓘ.



CROSS TRAINING OBJECTIVES

- Increase Professional technical capability to serve growers.
- Acquire new knowledge through hands on training supplemented with tangible tools.
- Adapt tools as appropriate and increase consistency of services where appropriate.



SOPs for
Irrigation
Evaluations

COLLECTED RESOURCES FOR AWQA



Thank-you for Sharing!

Expert Advisory Panel

Amy Storm LWA Ben Faber UCANR Dale Zurawski VC Farm Bureau
Ben Burgoa RCDMC Anne Coates Cachuma RCD
David Holden Holden Research Jamie Whiteford Ventura RCD
Michael Cahn UCCE Karen Lowell NRCS Pam Krone-Davis MBNMS
Brooks Engelhardt USDA GW Bates Coastal RCD
Kevin Peterson and Julie Fallon Cachuma RCD
Forrest Melton CSUMB/ NASA Cooperative



RESOURCE
CONSERVATION DISTRICT



2 CROSS TRAININGS AND 6 AUDITS



Pre Audit



Cross Training



Post Audit



Assessment

	2-Apr
Location	Salinas
9:00 AM	CropMange Training (UCCE)
12:45	Evaluation
1:00PM	EAP Tools at AQWA website (Pam)
1:30 PM	Nitrogen Budgeting and Fertilizers Guidelines (NRCS)
2:30 PM	Coastal Valley Irrigation Systems (RDO Water)
3:15 PM	Irrigation Management (RCDMC)
3:40 PM	Evaluation
3:45 PM	Soil Sampling and Nitrate Quick Test (UCCE)

	6-May
Location	Santa Maria
AM	Strawberry Field Day. Irrigation and Nutrient Management (UCCE)
1:15	Evaluation
1:30 PM	Introduction to AWQA Toolkits (RCD)
2:15 PM	Surface Renewal, Irrigation Scheduling (Tule)
2:45 PM	Soil Moisture Monitoring (Hortau)
3:15 PM	Filter, Hardware and Fertigation Issues and Solutions (Crop Protection Systems)
3:45	Evaluation
4:00	End

USE OF \$600 PRINTING FUNDS FROM GRANT

- 1) Printing SOPs or other online materials?
- 2) Print Poster for Sharing Tools at Events?



Irrigation and Nutrient Management Poster

Distribution Uniformity

Why Achieve Distribution Uniformity?

Distribution uniformity is a measure of how evenly water is applied across an entire field. The more uniformity the better irrigation can be scheduled to match plant water needs without over-watering or under-watering parts of the field.

Conserve Water

Minimize Run-off

Minimize Percolation

Use Nutrients Efficiently

Distribution Uniformity Lowest Quarter Measurements

Average depth of lowest quarter
Average depth of all locations

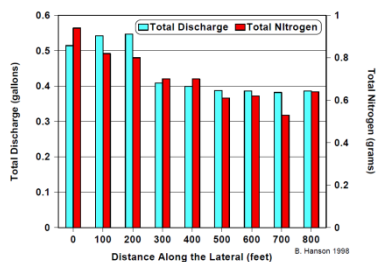


DU for drip should be > 85%



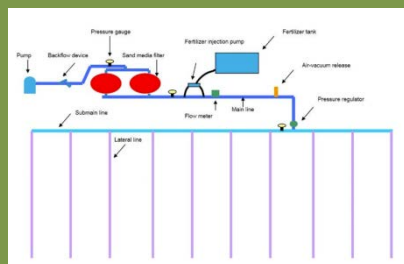
Even pressure is the Key to Uniform Distribution

What Does it Mean for Plants when this happens along the Drip Tape?



Elements of Irrigation Management

Irrigation System Design



Routine Maintenance Schedule

- Flush System
- Check Pressures - weekly
- Clean Sprinkler heads - weekly
- Check Nozzle Wear
- Observe Leaks - daily
- Check Drip Rat
- Check Filters

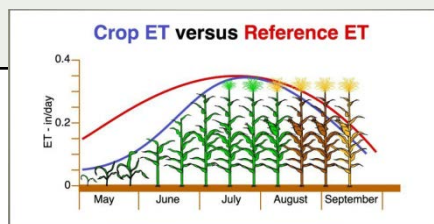
Distribution Uniformity Evaluation (Who?)

- Private Consultant
- Trained In-house Irrigator
- RCD, NRCS, UCCE or Water District

Irrigation Scheduling



Matching Plant Water Needs



Record Keeping

Irrigation Program					
Ranch Record - _____ (Year)					
RANCH:			DU: _____		
Block/Field:			Distribution Uniformity		
Crop & Plant Date:					
Irrigation Type:					
Rated or Measured Flow Rate:			Acre inch = 27,154 gal / acre		
Either flow rate (gpm or gph) for single head or emitter -OR- inches per hour for system.					
Irrigation		Irrigation		Application (inches) = Hrs x Flow Rate (inches)	
Date	Type	Date	Type	Application (inches) = Hrs x (gallons/27,154)	

Pump and Fertilize

Accounting for Nitrogen in Irrigation Water

$$\text{Lbs of N/acre} = \text{applied water (inches)} \times \text{NO}_3\text{N conc (ppm)} \times 0.23$$

How is nitrate in irrigation water converted to applied N?

lbs of N/acre=

$$\text{applied water (inches)} \times \text{NO}_3\text{-N conc (ppm)} \times 0.23$$

ET Treatment	Applied Water (inches)	Fertilizer N value	
		NO ₃ -N (ppm)	lbs N/acre
110%	7.0	19.3	35.4
160%	10.1	27.9	51.1

□ N in irrigation water has the same nutrient value as fertilizer sources of N. (Cahn et al. 2015)

□ Fertilizer values of N in NH4 and NO3 were equivalent.

□ Nitrogen in water affected both plant size and color



Soil Nitrate N

Drip Tape Selection

Poster Illustrations: Michael Cahn (UCCE), Jason Sharrett (CA Strawberry Commission), Michael Johnson (consultant), Marcus Buchanan (consultant)

WHAT INM RESOURCES ARE AVAILABLE?

Professionals:



Training & Education

CAL POLY

Irrigation Training
& Research Center



Online Resources

How much N / P / K does lettuce take up ?

- ✓ 120 - 140 lb N
- ✓ 12 - 14 lb P (28 - 32 lb P₂O₅)

Outline	Book	Index	Search
Table of contents			00:08
How much NPK? Demo ...			00:39
How much P removed ...			00:32
How much fertilizer is ...			02:12
Fertilizer management			01:18
Nitrogen and Phospho...			01:04
Plant available P			00:40
Long term consequences...			00:50
So P fertilization study...			00:33
Results			00:31
Anticouplant sprays			00:48
P Summary			00:33
P addition potential			00:34
Lettuce growth			00:39
Lettuce N uptake in Z...			01:00
Lettuce N uptake in Z...			01:21
Managing N fertilizatio...			01:11
Managing N fertilizatio...			00:47
Example			01:12
Nitrate leaching poten...			00:40
Plant available P			01:00
Pre-planting soil P...			01:02
Tests			00:33
Field averages			00:48
Calculating NPK / A...			00:38
Subsiding			00:24
Irrigation management			01:01

AWQA Website Toolkits

Toolkits

null

Irrigation Assessments



Learn about distribution uniformity and irrigation system evaluations.

Irrigation Systems & Scheduling



Learn ways to manage and schedule irrigation water application to match crop needs.

Nutrient Management



Learn ways to improve the amount, timing and content of fertilizer addition.

Co-management of Conservation and Food Safety



Learn ways to manage the field production environment toward accomplishing both

conservation and food safety objectives.

Sediment Control



Learn how to reduce soil erosion through row arrangement and cover cropping and how to contain soil on the farm through a variety of management practices and structural improvements,

such as grassed waterways and sediment control basins.

Water Conservation



There are many ways to save water on the farm, including capture of irrigation water and storm water, increasing the water content

stored in soil, and precision irrigation.