ADDING TOOLS INTO YOUR WATER MANAGEMENT TOOLBOX

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SCRI - CLEAN WATER^3
REDUCE, REMEDIATE, RECYCLE

Introduction

- Irrigation length, frequency, and timing vary based on a number of factors (temperature, wind, crop (growth stage, cultivar), container size, etc.)
- Every grower has developed a way of irrigating that seems to work well for them
- Can your irrigation practices be improved?
- What impact would irrigation changes have on your:
  - Crop growth?
  - Crop health?
  - Bottom line?

Introduction

- How do you know when to water your plants?
- How efficient do you think you are?
- Could you be saving water?
- Does it matter?
- What are the implications of over irrigation?
- What are the implications of under irrigation?

What does it take to change practice?

- Trust
- Benefits/costs ($, labor, quality)
- What do I need to do to measure X?
- Scaling
- User friendly
- Integration into existing practices
- Consistency

Fertilizer rate comparison

- How do my rates compare with other growers?
- Fertilizer = $$$$
- Could I reduce my rates without impact growth?

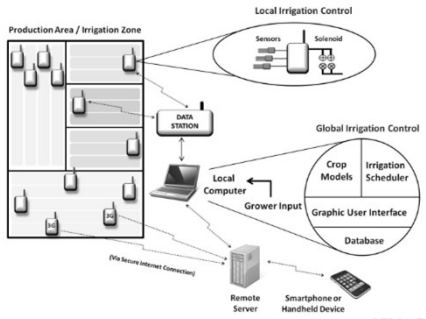
Mums

Container size	Number of MU's	Statistical value	Kg N/ ha/yr	Kg P_2O_5/ ha/yr	Kg K_2O/ ha/yr
Greenhouse Mums 4-8 L	7	Lower quartile	135	202	135
		Average	290	365	290
		Upper Quartile	484	535	484

Container size	Number of MU's	Statistical value	Kg N/ ha/yr	Kg P_2O_5/ ha/yr	Kg K_2O/ ha/yr
Container Mums 4-8 L	14	Lower quartile	33	11	21
		Average	62	17	38
		Upper Quartile	92	34	48

- Greenhouse mums: soluble fertilizer (6 of 7)
- Container mums: CRF fertilizer

Sensor Networks



Continuous cut flower production

- Closed system (control)
- Historic and current production records
- Analysis of:
  - Yield/production time
  - Quality
  - Costs
  - Profits

Annual profitability before/after sensors

	2007 -2009	2010- 2012	Difference	Change
Crops/ year	37	38	1	1 %
Stems/ year	106,308	139,382	33,074	31 %
Price/ stem	$ 0.59	$ 0.62	$ 0.03	5 %
Labor costs	$ 15,905	$ 17,893	$ 1,988	12 %
Electricity	$ 4,109	$2,923	$ 1,186	-29 %
Sensor system	$ 0	$7,147	$ 7,147	---
Revenue	$63,094	$ 85,679	22,585	36 %
Profit	$43,080	$57,716	$14,636	34 %

Payback period on upfront costs: 16 months

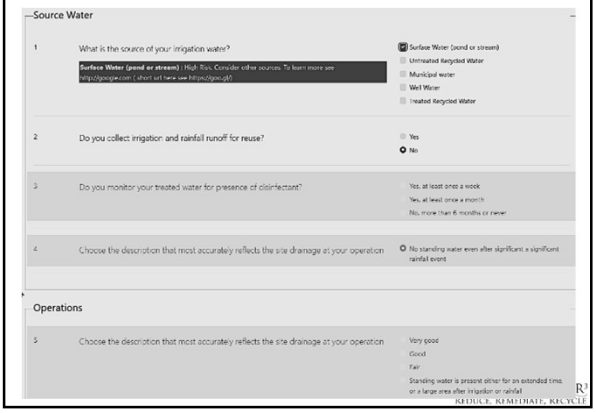
Reducing Disease Pressure

- Factors impacting disease presence and movement
  - Plant source
  - Irrigation (timing, type)
  - Water movement (or a lack of it)
  - Soils
  - Species grown

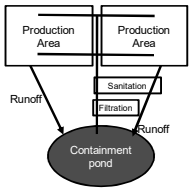
- Where should I focus (time, money, labor) to reduce disease problems?

Disease management

- Site selection and maintenance
- Water management
- Plant purchases
- Plant propagation
- Media
- Diseased plants
- Scouting



Chemical treatment of recycled water



- Efficacy is dependent on:
  - Chemical used
  - Organic mater in water
  - Contact time
- Cost is a major factor
  - Installation
  - Maintenance
  - Supplies
- Other considerations
  - Value (cost vs profits)
  - Volume to treat
  - Land availability
  - Changes in practice

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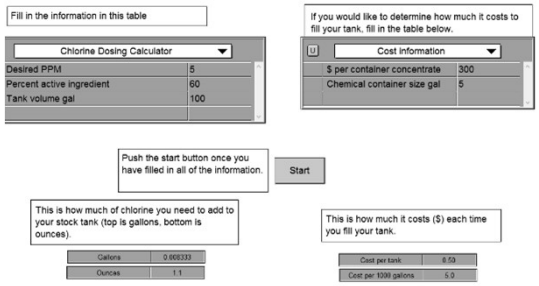
Chlorine calculator



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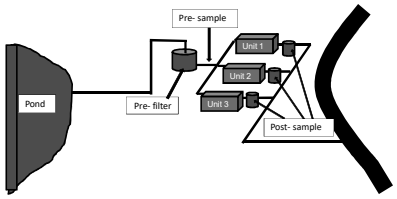
Phosphorus removal



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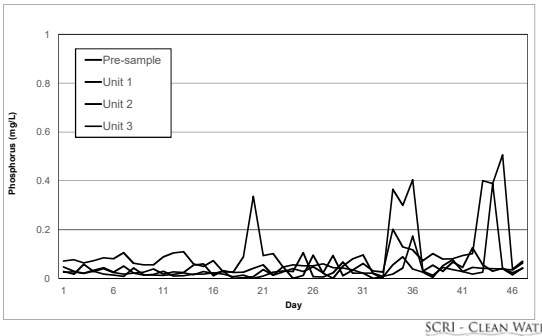
Iron Oxide



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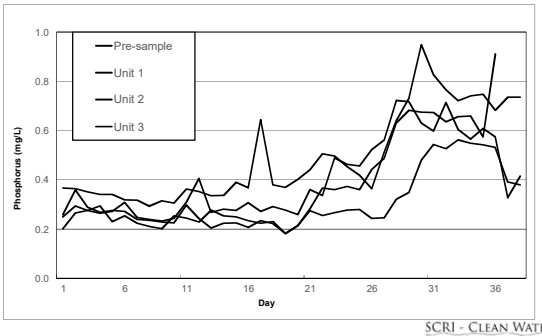
Calcined clay



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Future tools

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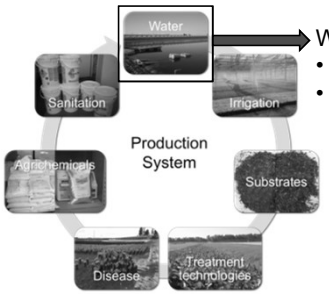

Water:
- Water budget
- Rainfall capture

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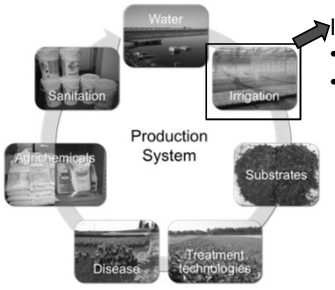

Irrigation:
- Distribution uniformity
- Leaching fraction

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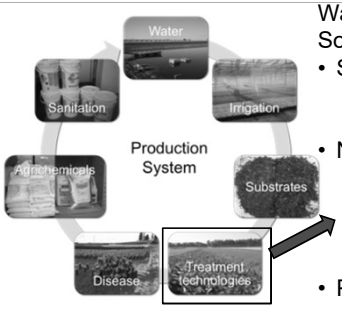

Water problems and Solutions:
- Sediment
  - Filter socks
  - Sediment basins
- Nutrients
  - Vegetated buffers
  - Bioreactors
  - FTW
  - Wetlands
- Pathogens
  - Slow sand filters
  - Serial ponds

Pesticides:
- Slow sand filters
- Bioreactors
- Activated charcoal

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Questions?????

Stay tuned at www.cleanwater3.org

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