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?

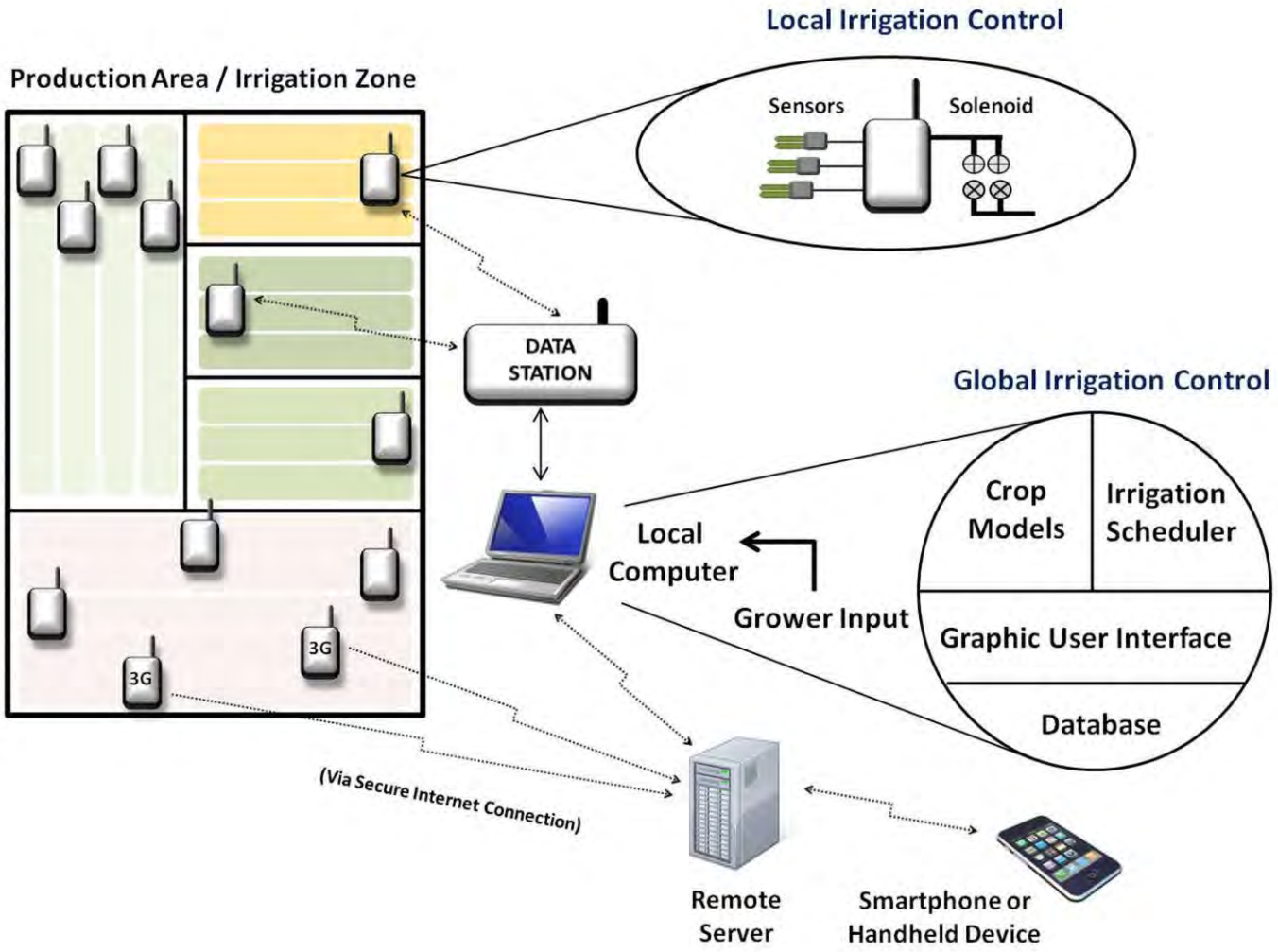
Mums

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 %

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

Source Water

1 What is the source of your irrigation water?

Surface Water (pond or stream) : High Risk. Consider other sources. To learn more see http://google.com (short url here see https://goo.gl/)

- [x] Surface Water (pond or stream)
- [ ] Untreated Recycled Water
- [ ] Municipal water
- [ ] Well Water
- [ ] Treated Recycled Water

2 Do you collect irrigation and rainfall runoff for reuse?

- ( ) Yes
- (•) No

3 Do you monitor your treated water for presence of disinfectant?

- ( ) Yes, at least once a week
- ( ) Yes, at least once a month
- ( ) No, more than 6 months or never

4 Choose the description that most accurately reflects the site drainage at your operation

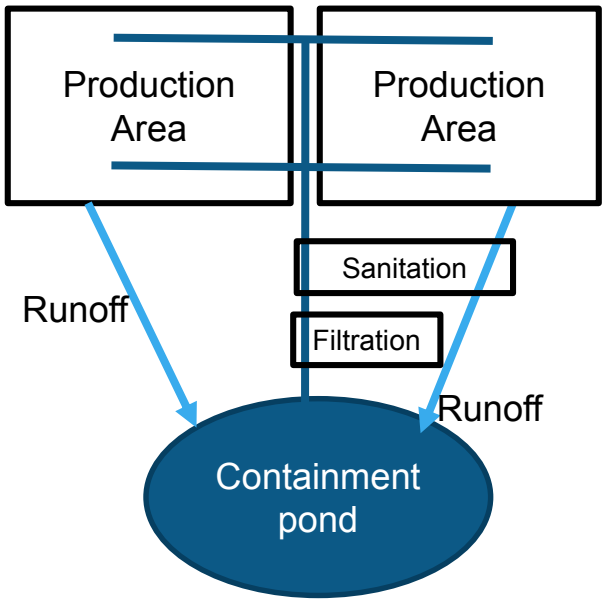
- (•) No standing water even after significant a significant rainfall event

Operations

5 Choose the description that most accurately reflects the site drainage at your operation

- ( ) Very good
- ( ) Good
- ( ) Fair
- ( ) Standing water is present either for an extended time, or a large area after irrigation or rainfall

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

Chlorine calculator

Fill in the information in this table

Chlorine Dosing Calculator	
Desired PPM	5
Percent active ingredient	60
Tank volume gal	100

If you would like to determine how much it costs to fill your tank, fill in the table below.

U	Cost information	
	$ per container concentrate	300
	Chemical container size gal	5

Push the start button once you have filled in all of the information.

Start

This is how much of chlorine you need to add to your stock tank (top is gallons, bottom is ounces).

Gallons	0.008333
Ounces	1.1

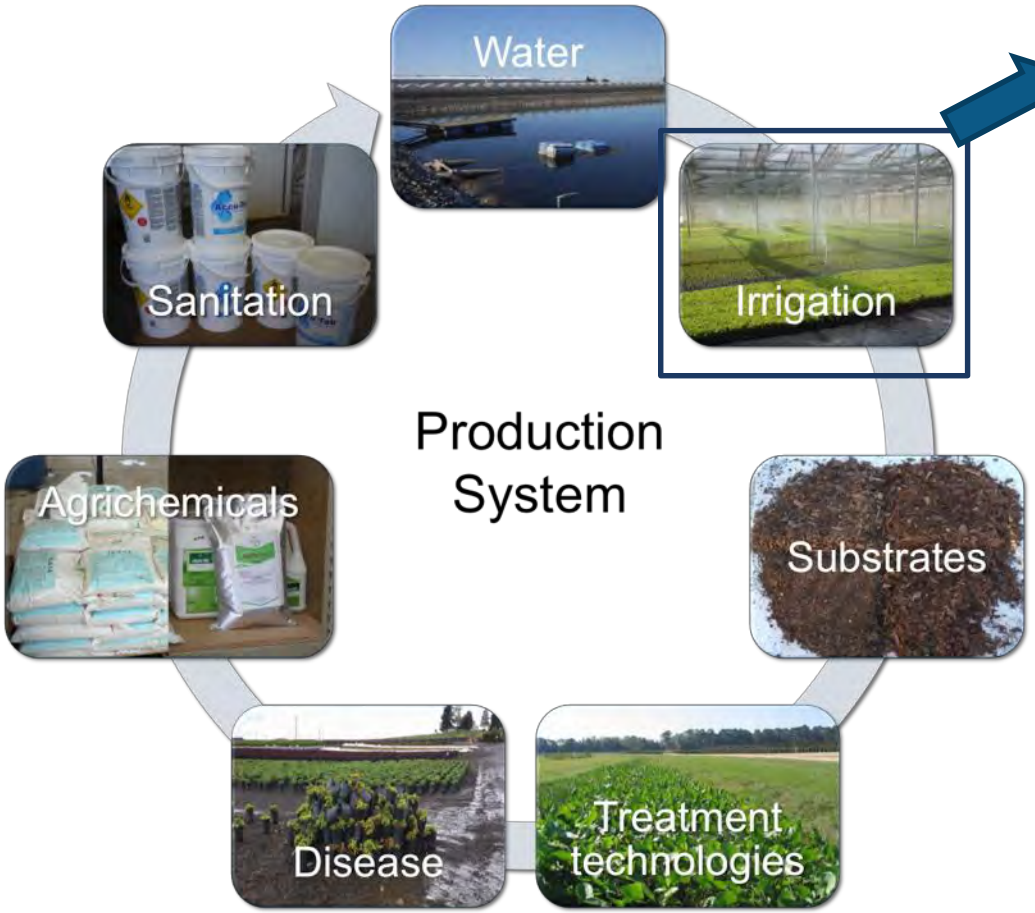
This is how much it costs ($) each time you fill your tank.

Cost per tank	0.50
Cost per 1000 gallons	5.0

Future tools

Water:

- Pond size calculation
- Water budget
- Rainfall capture

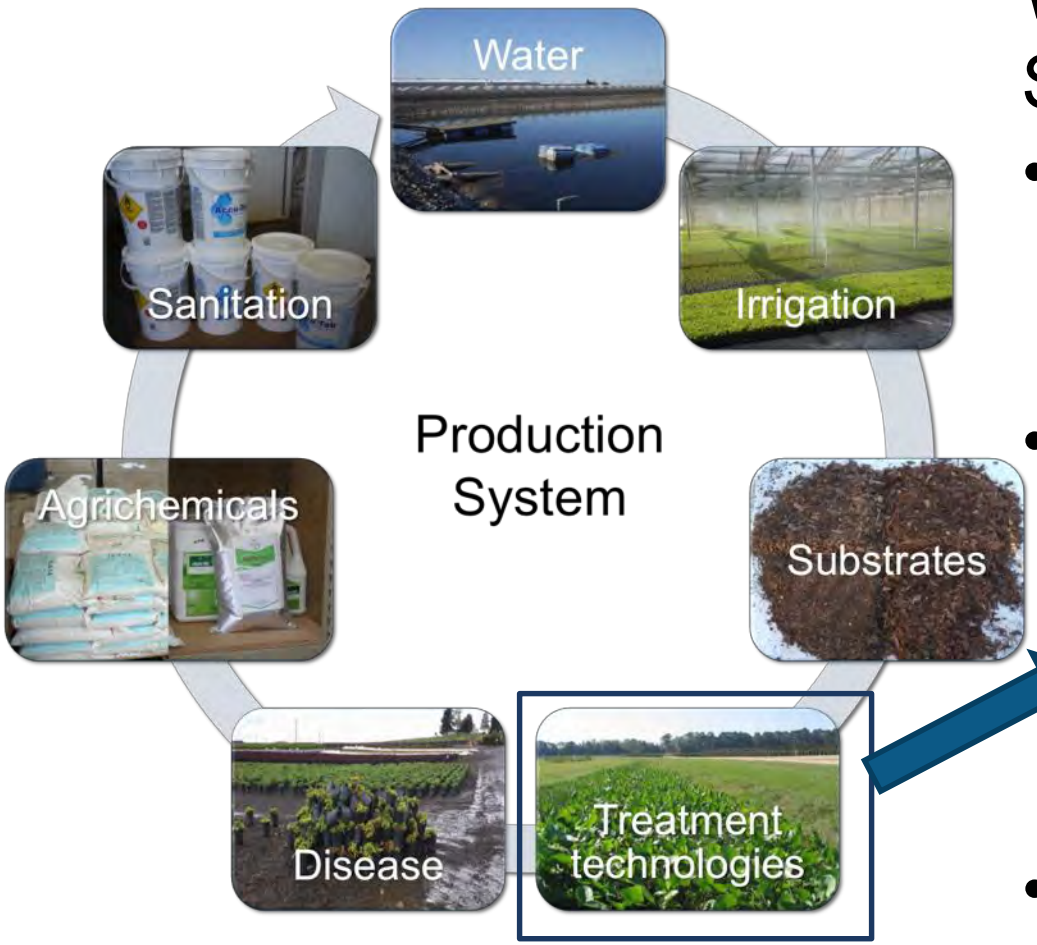


Irrigation:

- Distribution uniformity
- Leaching fraction

Substrates:

- Water movement modeling (Hydrus)
- Lime calculator
- CRF calculator



Water problems and Solutions:

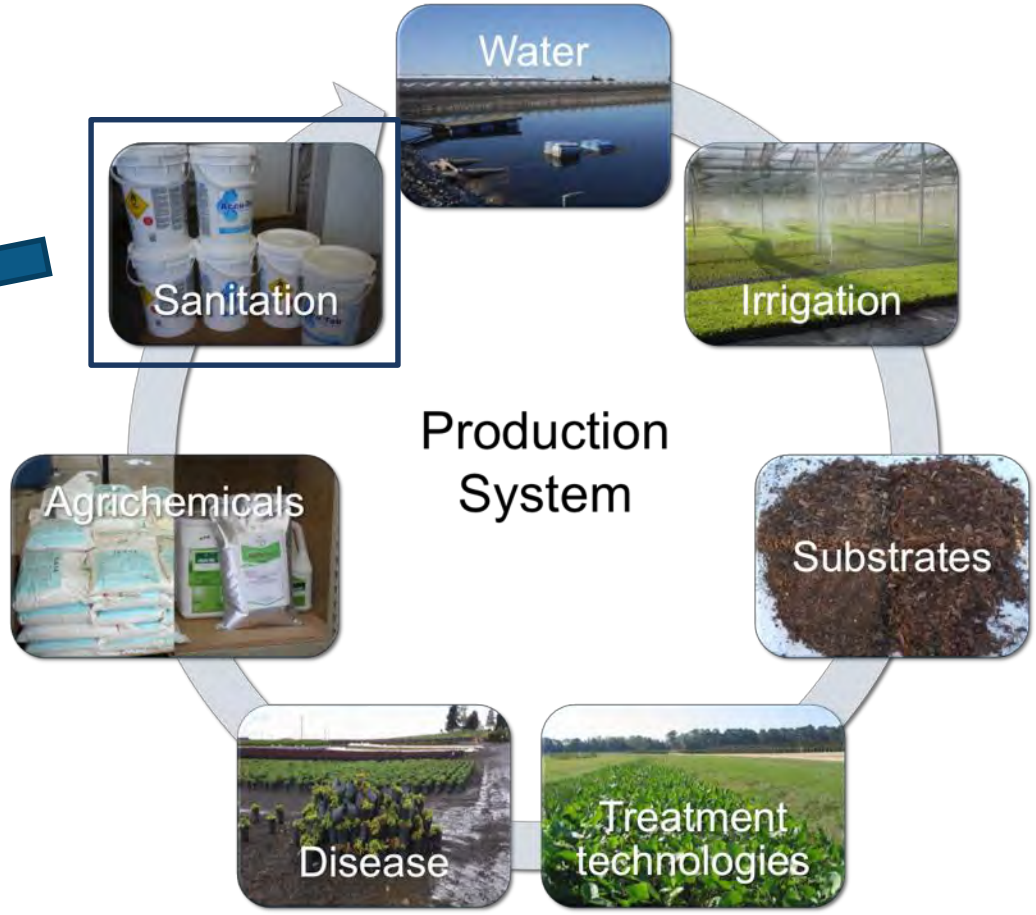
- Sediment
  - Filter socks
  - Sediment basins
- Nutrients
  - Vegetated buffers
  - Bioreactors
  - FTW
  - Wetlands
- Pathogens
  - Slow sand filters
  - Serial ponds

Pesticides:

- Slow sand filters
- Bioreactors
- Activated charcoal

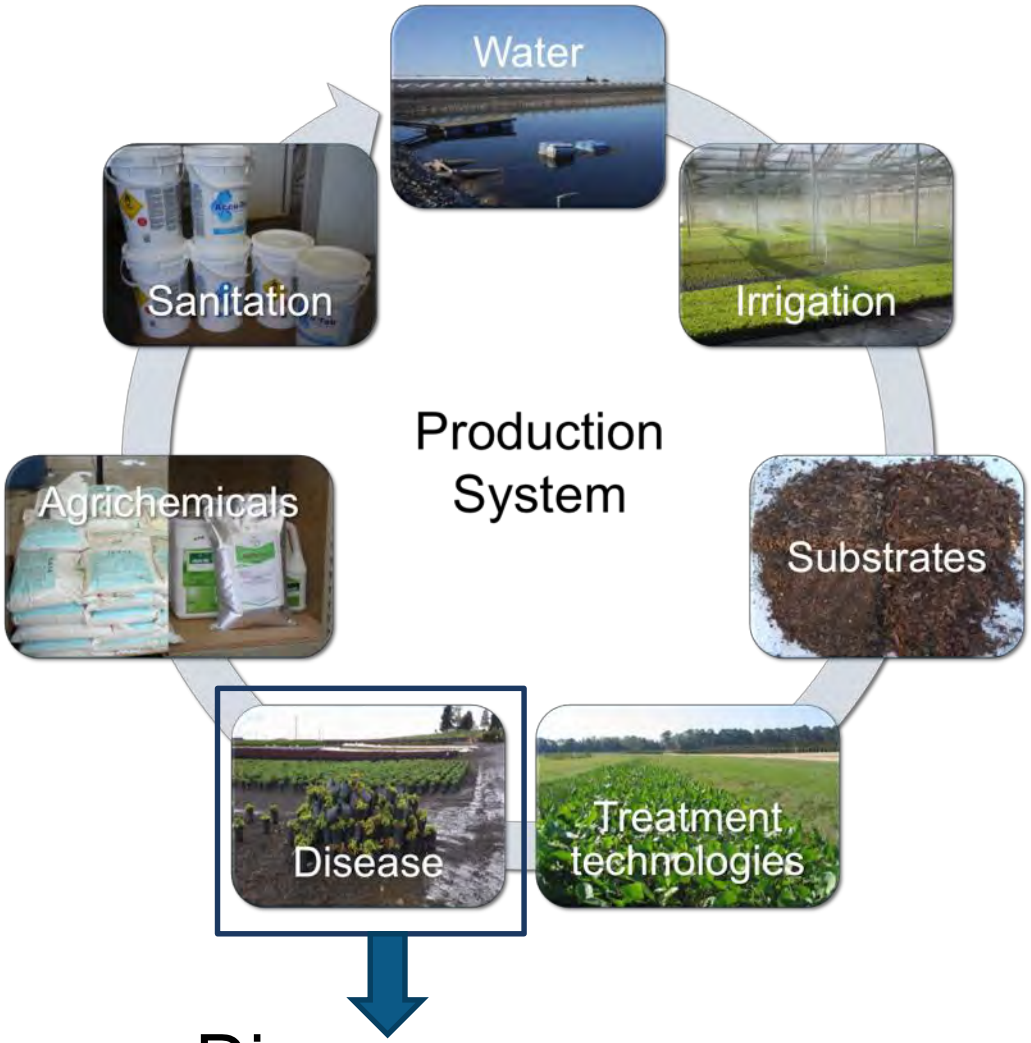
Sanitation:

- Chlorination (cost comparison)
  - Liquid
  - Gas
  - Solid
- Ultraviolet



Agrichemicals:

- Liquid fertilizer dilution calculator
- Calibration calculator



Disease:

- Critical control points

Questions?????

Stay tuned at www.cleanwater3.org

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