RESEARCH UPDATE

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Project Manager; Washington Tree Fruit Research Commission

Science

- Huge knowledge gaps exists
  - Methodology
  - Pathogen survival
  - Commodity specific risk
  - Intervention steps
- Need for accurate microbiological data at each step of the production chain to assess risk

Where to start?

- There is no zero risk
- Systems approach to reduce risk along the food chain

1. Limit pathogen introduction
2. Reduce pathogen levels/ manage cross contamination
3. Develop a kill step (long term goal)

Food Safety Research

- **Partner in Research with CPS (Center for Produce Safety)**
  - 1 current project (5 total)
  - NEW: regional approach to food safety research
  - Preparation of state block grant proposals
  - Local project collaborator
- **NHC Food Safety Committee (former PNFSC)**
  - Involved in industry priority setting, information dissemination, development of collaborations with scientists
- **WTFRC funding**
  - 3 current projects (EC, Listeria, Impingement drying)

Current Food Safety Projects in PNW

Keyword	PI	Affiliation(s)	Funding Source	Amount
Water source	Killinger	WSU, UW, WTFRC	WTFRC; WCFS*	275,000
EC	Killinger	WSU, UW, WTFRC	WTFRC	190,000
Packingline	Killinger	WSU	WTFRC	85,000
Listeria	Killinger	WSU, WTFRC, UC Davis	WTFRC	66,000
Bin sanitation	Killinger	WSU	CPS-SCBG	166,000
Risk	Wetherington	Intertox	CPS-WTFRC	78,000
Dumptank	Wetherington	iDecisionScience	WTFRC	94,000
Dryer	Ganjyal	WSU	WTFRC	57,000
Bacteroids	Suslow	UC Davis; UoA	CPS-SCBG	336,000
Water (2)	Atwill	UC Davis	FDA	198,000

* Western Center for Food Safety

What is our BIGGEST concern? WATER!

- NOT APPLICABLE IF NON-POTABLE WATER DOES NOT HIT EDIBLE PORTION OF TREE !!!!!!

What is our BIGGEST concern? WATER!

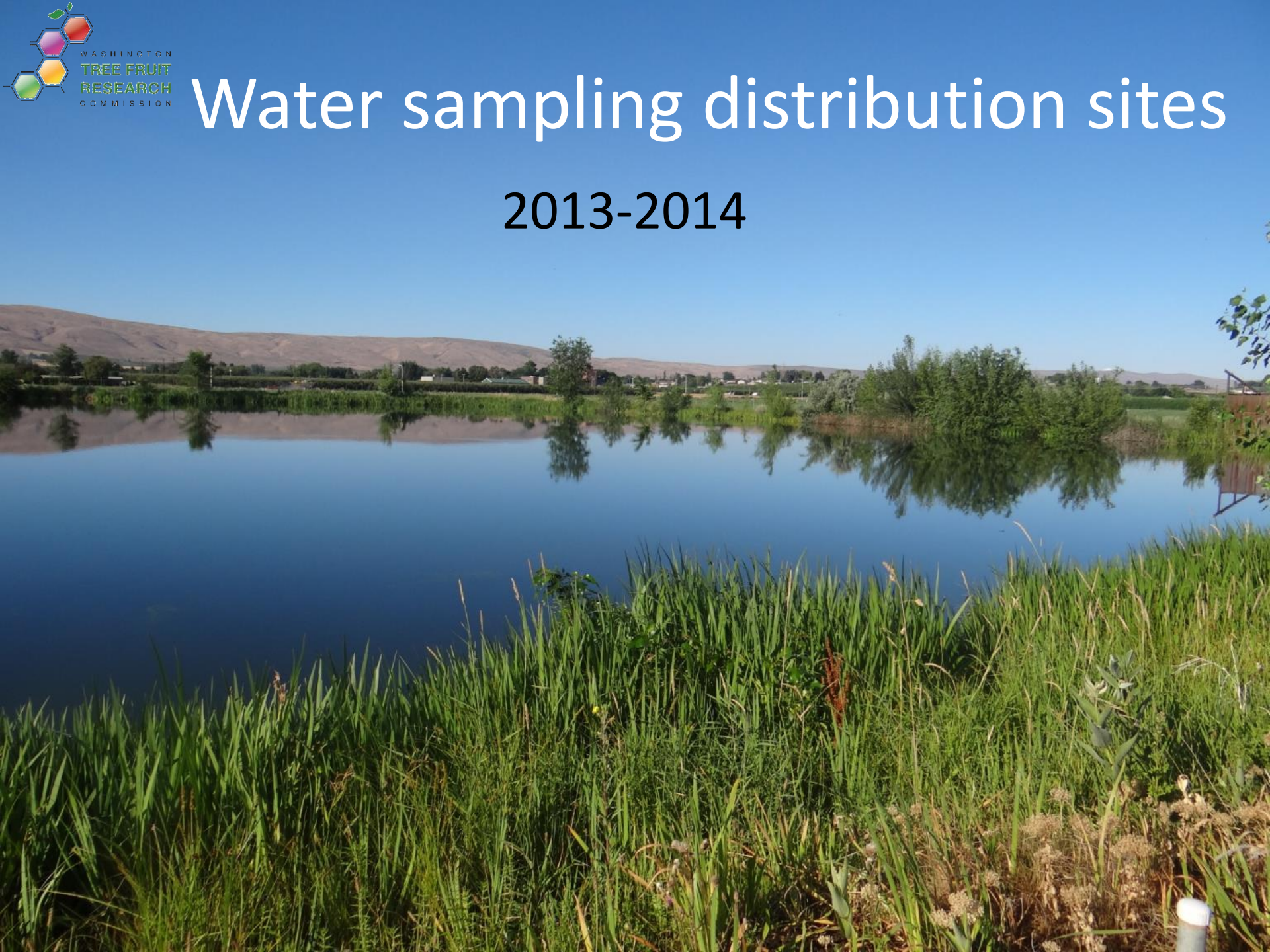
Proposed SUPPLEMENTAL Rule Requirements:

- Updated Water Quality Standards- Tiered Approach
  - Statistical Threshold Value (STV) of less than 410 CFU generic E. Coli
  - Geometric Mean (GM) of less than 126 CFU generic E. Coli
  - If water meets BOTH of standards above, no additional treatment rq'd
  - If water does not meet standards, can apply a "die-off" interval

Modified from Laura Grunenfelder, NHC

Water sampling distribution sites

2013-2014



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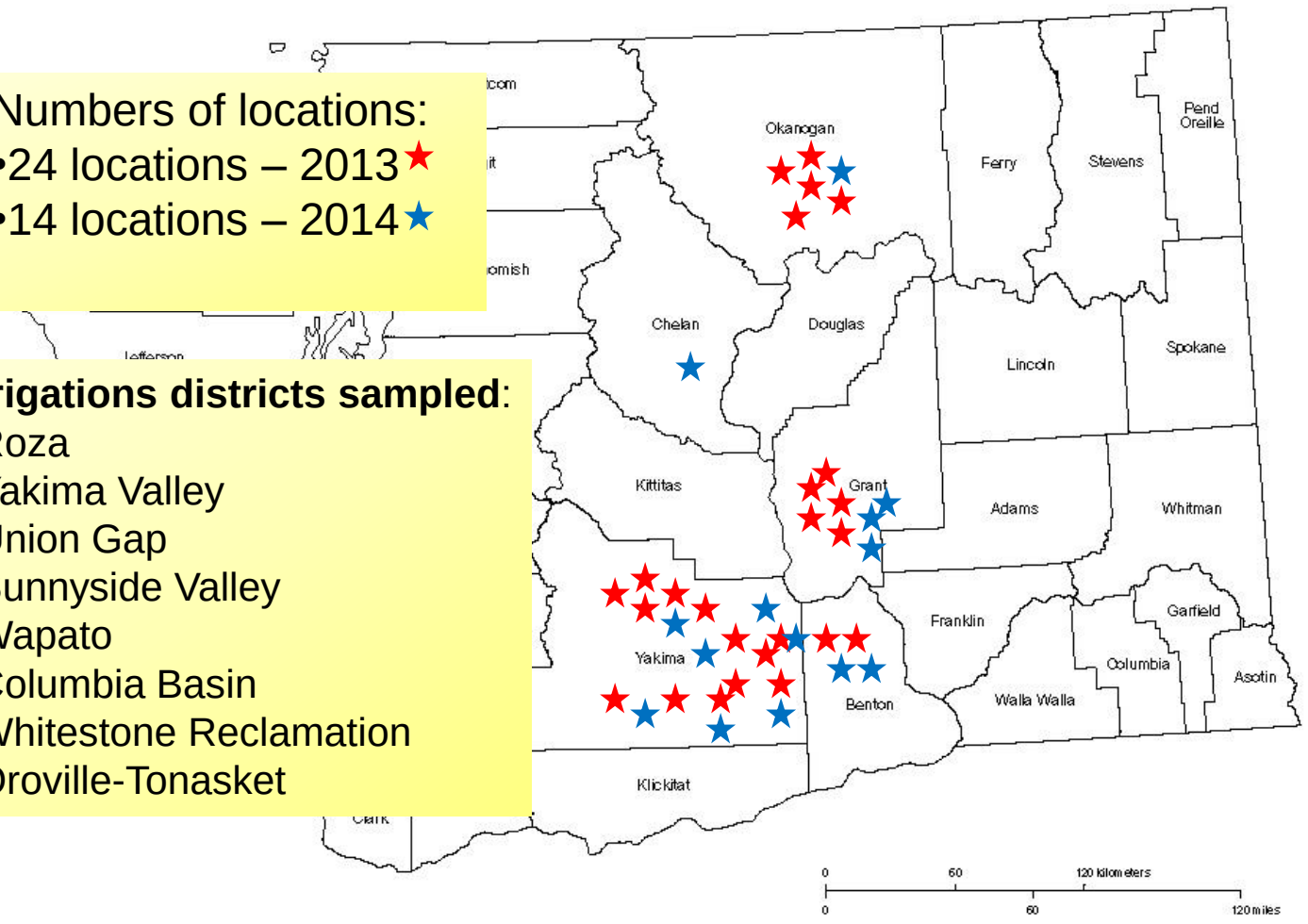
★ 2013 ★ 2014

Numbers of locations:
- 24 locations – 2013★
- 14 locations – 2014★

Irrigations districts sampled:
- Roza
- Yakima Valley
- Union Gap
- Sunnyside Valley
- Wapato
- Columbia Basin
- Whitestone Reclamation
- Oroville-Tonasket



Different types of sampling

River



Pond



Canal/ Lateral



Different types of sampling

Ground sprinkler

Overhead cooling sprinkler

Misting sprinkler

Our Situation

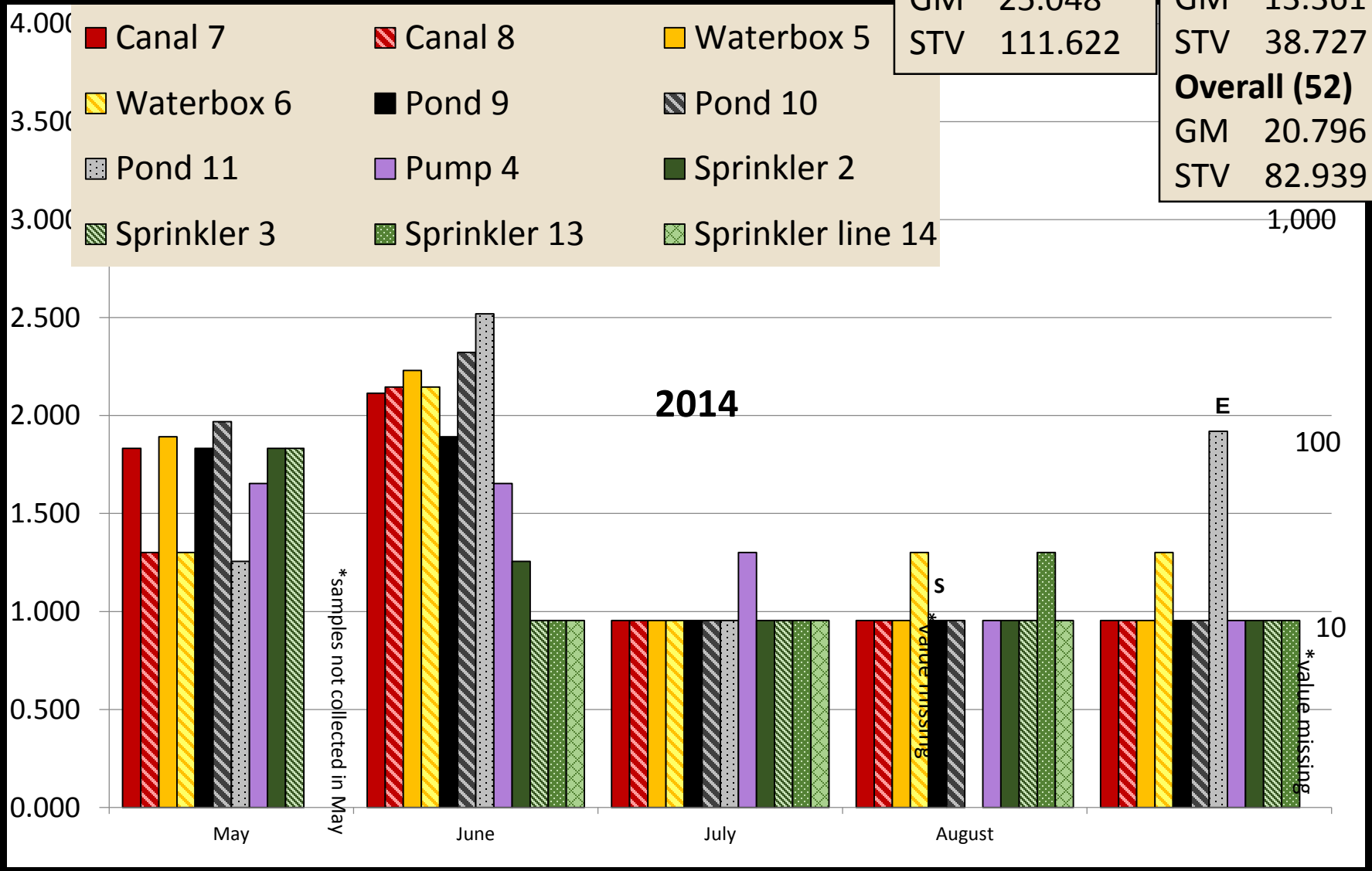
- Year 2: 14 samples exceeded proposed standards
  - Geometric mean, single samples
- Year 3: 1 location exceeded proposed standards
  - Statistical threshold value
- Data available to assess and discuss regulatory proposals and guidance
  - Influence of water source
- Engagement between industry, regulatory and academic groups

WASHINGTON TREE FRUIT RESEARCH COMMISSION

Location 26
Generic *E. coli* levels (log MPN/100mL)

Canal (10)	
GM	20.500
STV	93.291
Water box (10)	
GM	25.048
STV	111.622

Pond (14)	
GM	31.245
STV	179.447
Sprinklers (18)	
GM	13.361
STV	38.727
Overall (52)	
GM	20.796
STV	82.939



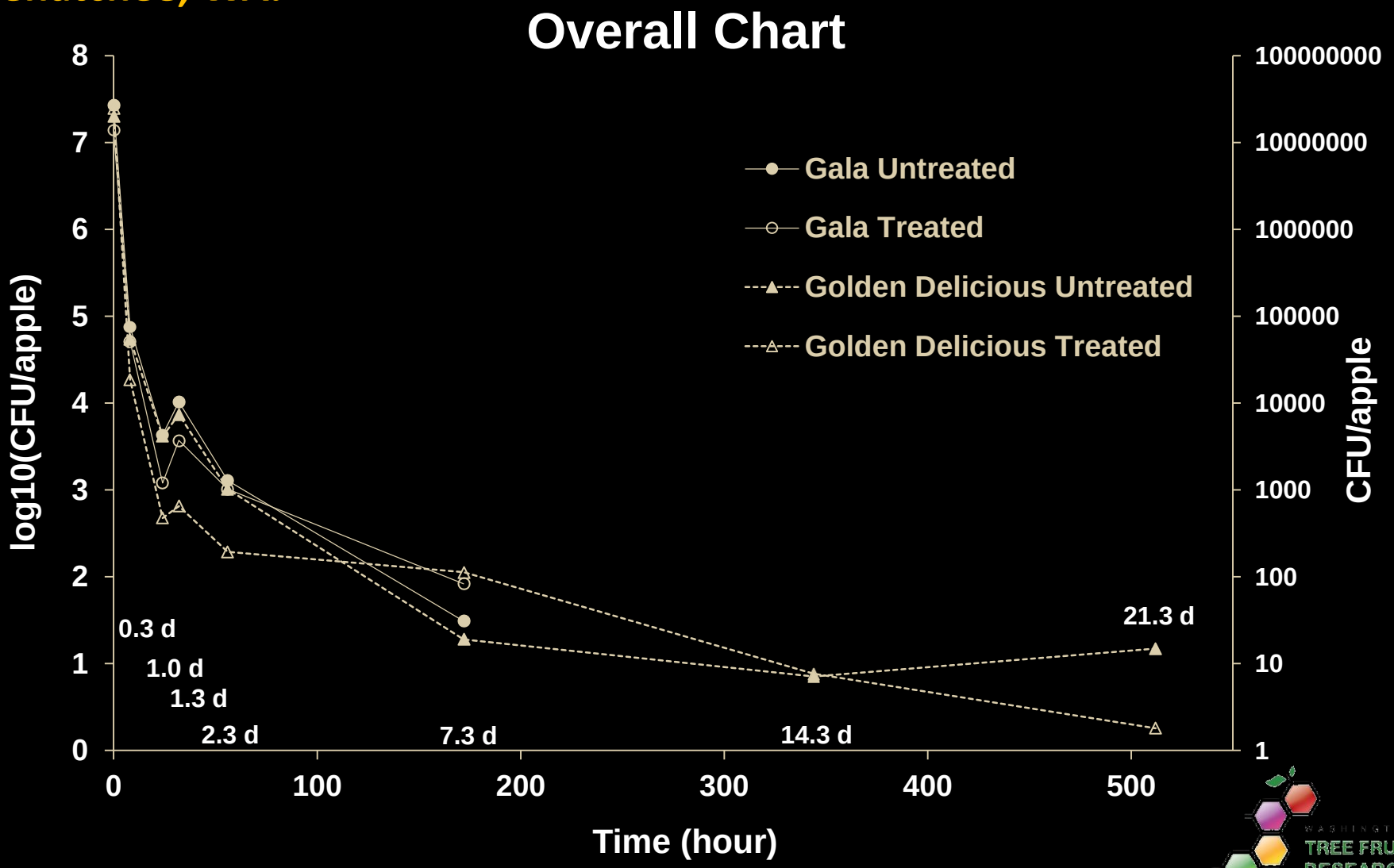
What is our BIGGEST concern? WATER!

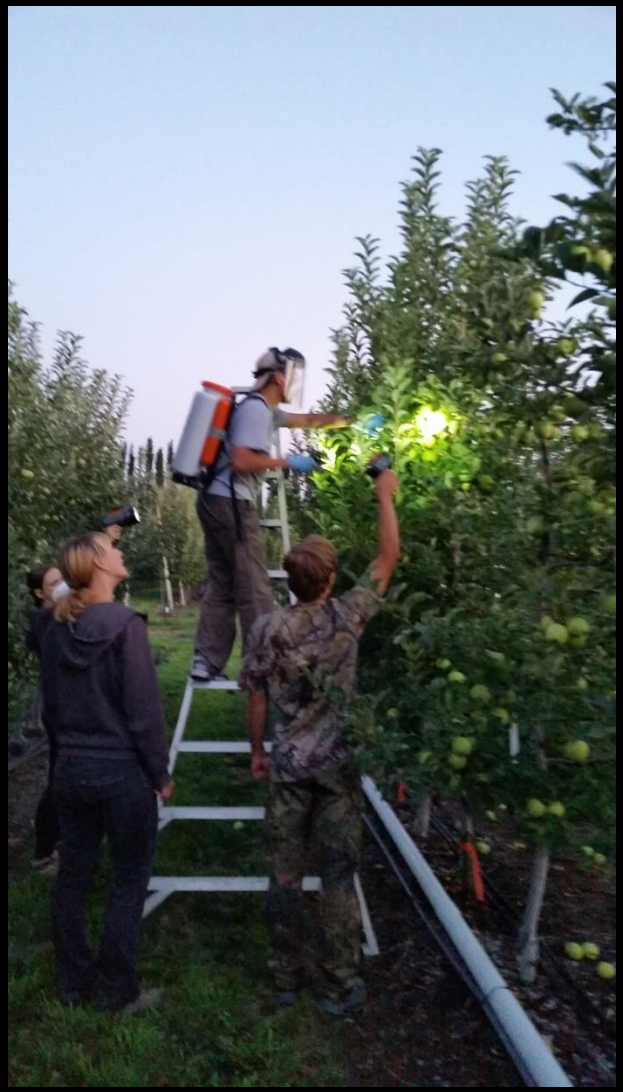
Proposed SUPPLEMENTAL Rule Requirements:

- Bacterial “die-off” intervals
  - Microbial die-off rate of 0.5 log reduction per day (pre-harvest)
  - Apply time interval between harvest and end of storage using appropriate microbial die-off rate (TBD through research)

Modified from Laura Grunenfelder, NHC

Figure 1. Overall average of generic *E. coli* levels on Gala and Golden Delicious apples with (treated) and without (untreated) overhead evaporative cooling water from an open surface water source near Wenatchee, WA.




Evaluation of an alternative irrigation water quality indicator

Trevor Suslow and Channah Rock

Funded by Center for Produce Safety in collaboration with 3 States: WA, OR, CA

Goal: Replacement of non-functional quantitative irrigation water standards with a simpler semi-quantitative threshold

"Microbial communities in surface water supplies: a multi-state project"

"Microbial communities in surface water supplies: Canal Priming Event"

- PI: Rob Atwill, UC Davis
- $198,000.00 in 2015
- Funding source: FDA

Apple growing and packing microbial risk factors and their potential to lead to foodborne disease outbreaks

Diane Wetherington, Intertox

- To evaluate microbial food safety risks and potential health effects associated with the application of evaporative cooling water using quantitative microbial risk assessment (QMRA).

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