

**Produce Research Priorities Meeting
June 24, 2010**

Water (Field and Processing)

Summary

Agricultural water is used extensively during the production, harvest and postharvest handling of fresh fruits and vegetables. Water is a potential vector to spread the contamination of enteric human pathogens to fresh produce. This session discussed research needs associated with means of detecting, eliminating and/or reducing the potential risk of human pathogens being associated with agricultural water and postharvest water use.

Research Priorities

I. Risk potential vs. risk exposure

- Are current commercial tests based on generic *E. coli* adequate?
- How consistent is the methodology for establishing compliance/non-compliance (kits, assay temperature, other assay conditions)?
- What is the optimal sample volume and sampling protocol?
- How does water movement over landscapes affect sampling efficacy?
- How can linkages between the presence of pathogens in water and crops be defined?
- Should there be separate approaches to testing drip vs overhead irrigation water?
- How adequate is the methodology for detecting and enumerating live, dead, viable but nonculturable pathogens and other members of the microbial communities?
- What are predictive indicators for microbiological produce safety: how reliable/usable they are?
- *Salmonella* and viruses are often under-represented: do we need better indicators and risk factor assessments for these pathogens?
- How valid are the methodologies for water testing in different regions? How do climate factors and environmental events interfere?
- Can industry data be made available and included into a meta-analysis?

II. Intervention and Mitigation Technologies

- What is the effectiveness of different intervention strategies? For example, use of copper, UV-filtration, chlorine dioxide, CaOCl₂ in on-farm tests and validations, especially for disinfection of the “high burden” waters? How can dose monitoring be improved?
- What are the limitations of the efficacy of wash-water treatment for produce?
- Bridging the scale issues: what is the link between commodity-specific technologies and watershed ecology of pathogens?

- Are there biological interventions that can be used in water?
- How can biofilms (a potential reservoir for pathogens) be controlled? How do biofilms in protected niches on produce affect accessibility of chemical intervention (“-cides”) to control pathogens?
- What approaches can be used for disrupting attachment of pathogens to produce?
- What are the social issues that may effect change in accepting various practices?

III. Post-harvest treatment of water

- What chemicals and implementation technologies are best choices? What is the adequacy of these technologies for target pathogens?
- How can hurdle technologies (combining chemical and physical methods) be used for produce sanitation?

Discussion

- Need to review audit criteria: source of water, mode of irrigation, crop traits and crop development stage
- Need for science-based standards and cost-effective sampling methods