

**Brief Report Day 2**  
**CPS Research Symposium 26 and 27<sup>th</sup> June 2013**  
**Robyn McConchie**

The CPS at the University of Davis has been very supportive of the initiatives in Australia to establish an affiliated Fresh Produce Safety Centre. Over the past year they have very generously shared their research outcomes, they have given presentations to our industry, and this year invited Australian researchers to apply for research grants to work collaboratively with US scientists on issues important for the Australian fruit and vegetable industry.

As part of the ongoing collaboration Dr Robyn McConchie from the University of Sydney was invited to take part in a panel session at the recent 2013 CPS Research Symposium held at Wegman's Conference Centre in Rochester, NY State. Due to the increasing awareness and interest from the US industry, the Research Symposium was held over 2 days.

This is a short report on the projects presented on the second day on "*Water Quality for Irrigation and Postharvest Practices*", "*Pathogen transference: Pre-harvest, harvest and Packaging.*" And "*Hot Topics.*"

Below is a summary of the key messages from the Symposium from the second day.

***"Water Quality for Irrigation and Postharvest Practices",***

- Irrigation water quality testing uses presence of generic *E.coli* as an indicator of faecal contamination, however detection limit varies between test methods. The maximum permissible level of *E. coli* is <126/100 mL in Australia and the US (same as swimming pools) and presents minimal risk. The message was to ensure the detection limit for the method used is at least lower than this limit.
- Note that data presented in 2102 showed that there was limited correlation between presence of *E. coli* and presence of Salmonella in irrigation water and that changes in season, animal incursion, warmer temperatures and increased recreational use by humans increased the risk of Salmonella presence in water.
- The risk or probability of illness occurring from a water source is related to prevalence and amount of the pathogen in the water source, method of irrigation, and amount consumed. Using models to predict the probability of illness occurring with 126 *E.coli*/100ml under different irrigation regimes on lettuce, it was reported that illness may occur in 9 per 100 million people for subsoil drip irrigation, 1.1 per 100,000 people for furrow irrigation and 1.1 in 1,000 people for sprinkler irrigation. Irrigation methods that reduce water contact with the product reduce risk of illness.
- Dr George Villidis presented data that showed each water source (i.e. dam, bore, river, and tank) had different risk factors that must be assessed and risk varies according to season and potential run-off, filtration etc. Sampling regimes must reflect the risk level for each situation.

- Postharvest washing is an opportunity to cross contaminate. Data presented by Dr Trevor Suslow showed significant cross contamination in coriander spiked with Salmonella, during the postharvest washing process using chlorine as sanitiser. Management and verification of sanitizers is a crucial step in minimising risk of cross contamination, and includes sanitizer concentration, pH, organic load, turbidity, temperature, ORP, product contact time and temperature differential between product and water.

### ***“Pathogen transference: Pre-harvest, harvest and Packaging.”***

- Handwashing by staff is key to the food safety culture – ensure staff realise the importance with notices, incentives for good practices and training. The debate on wearing gloves is still going on. Research outcomes point to the need to wash hands before putting on gloves. Nitrile gloves were shown to transfer less bacteria and norovirus followed by latex gloves but both must be used with a sanitiser to prevent pathogen transfer. Chlorine buckets with >50 ppm at pH6.5-7 should be placed at strategic points for periodic dipping such as coming in from the field and while on the packing line. Bare hands are not recommended because of risk of norovirus transfer which are easily picked up and transmitted.
- Dirty wet cloths used for wiping produce or equipment facilitate transfer of microbes very well. Best to eliminate cloth wiping all together.
- Older worn buckets used for tomato picking were less likely to transfer Salmonella than new buckets but transfer could occur in both if pathogens were present. Pathogens resided in the cracked rough surfaces and were not in direct contact with produce. On the new smooth surface pathogens were exposed, facilitating transfer to product. Biofilms can build up on harvesting equipment especially abraded surfaces. Presence of soil on the containers harboured pathogens so washing is recommended. The key messages are to use nitrile gloves, don't use cloths to wipe produce or equipment especially wet ones, clean all bins and equipment with a power chlorine wash to prevent transfer of pathogens to produce.
- Proximity to intensive animal feedlots poses a significant risk of crop contamination, particularly O157:H7, through transfer of dust particles and bioaerosols by wind. Data showed that bioaerosols and dust can be transferred up to 200 m but level of crop contamination would be dependent on distance from the feedlot, the intensity of the feedlot, wind speed and direction, moisture, movement within the feedlot and humidity.

### ***“Hot Topics.”***

- Under stress conditions such as dessication or high temperatures Salmonella becomes resistant and is harder to kill. This is a critical consideration when composting for example, to ensure the heating up process is fast enough to reduce build-up of resistant organisms. Salmonella was also reported to be much more resilient and survive for longer in soils than attenuated *E.coli* O157:H7, and be more resistant to the antimicrobial action of isothiocyanates from brassicas. Studies are now being conducted in Australia on Salmonella survival under differ soil and moisture conditions, with Australian serovars
- A risk assessment should be undertaken for individual crops along the supply chain from seed to the consumer, as some crops are considered riskier than others. For example Salmonella and the shiga-toxin producing *E.coli* were reported in over 30 coriander samples in the last 10 years raising concerns for the industry.

For further information contact Dr Robyn McConchie [robyn.mcconchie@sydney.edu.au](mailto:robyn.mcconchie@sydney.edu.au) or the CPS Symposium Summary by following the link here: [www.freshproducesafety-anz.com/2013/07/29/10-lessons-learned-at-the-2013-cps-symposium/](http://www.freshproducesafety-anz.com/2013/07/29/10-lessons-learned-at-the-2013-cps-symposium/)