Title: Evidence of Microbial Transfer from Furrow Water to Leafy Greens during Irrigation.

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Introduction:
Agricultural surface water used for irrigation can become contaminated and has the potential to transfer pathogens onto crops through furrow irrigation, which means harvested crops can then transfer that contamination onto equipment causing cross contamination and risk to public health.

Purpose:
To evaluate commercial scale produce production practices in order to provide evidence of microbial transfer from contaminated furrow irrigation water to crops and then into the harvesting chain.

Methods:
Irrigation water spiked with *E. coli* TVS353 was applied to axial leaves of the first three heads of romaine on each line of a one-acre plot at a concentration of 1 x 10E5 CFU/100mL. Standard "S" and "Z" pattern pre-harvest sampling of n=60 was conducted 7 days after contamination. Four 100g sub-samples were enriched then 100 uL of enrichment spread plated onto ChromAgar ECC + 80ug/mL Rifampicin. On harvest day, five sampling teams positioned in front of a harvest crew and swabbed the following locations: workers gloves, knives, cutting table, conveyer belt, elevator/down spout. Crews stopped every 15 minutes (5 stops per acre); during each "stop", sampling teams swabbed the aforementioned surfaces.

Results:
Results indicate "Z" pattern samples 4/4 (100%) positive and "S" pattern 0/4 (0%) positive. Commercial Harvest Stop #2 shows *E. coli* TVS353 contamination on gloves, knife, and table indicating furrow contaminated romaine can transfer *E. coli.* Stop #3 had no contamination on gloves or table and stop #4 & #5 no *E. coli* TVS353 was detected. Post-harvest bin sampling of furrow contaminated fields resulted in zero detectable bacteria.

Significance:
Contamination simulations were detectable through harvest and point to the ability of furrow contaminated water to transfer to harvestable romaine lettuce. Resulting best management practices include raised bed height, omission of harvest at the head of the field, and improved or increased frequency in knife cleaning practices.