Microbial Contamination and Die-Off on Plants Irrigated with Treated Wastewater

Introduction

• Wastewater influent typically has high levels of potentially harmful bacteria
• Wastewater treatment plants significantly reduce the number of bacteria resulting in low bacterial counts in the effluent
• Wastewater plants then typically either discharge to the environment or to a secondary water system
• Secondary water systems are utilized for landscape and crop watering
• Wastewater effluent is generally high in valuable nutrients for plants, but also possibly allows remaining bacteria to regrow
• Using treated wastewater for crops has the potential to contaminate the crops with harmful bacteria

Objectives

• Determine if crops irrigated with treated wastewater are being microbially contaminated
• If crops are contaminated, determine how long contamination persists

Methods

• Irrigate field in Hyrum, UT for 12 hours
• Take plant samples immediately after irrigating and then daily for 5 days afterward
• Dilute plant samples in measured amounts of DI water to quantify microbial load
• Process the samples using IDEXX colilert and enterolert

Results and Conclusions

• Water at source has higher microbial load than wastewater plant effluent indicating regrowth in water system
• Plants had high initial coliform and enterococcus levels that decreased over time but only one E. coli detection in initial samples
• Crops are microbially contaminated by treated wastewater
• Contamination primarily persists less than 48 hours