

Lettuce Production in Yuma: ***Some noted differences (ag practices and environmental conditions) that might influence risk levels***



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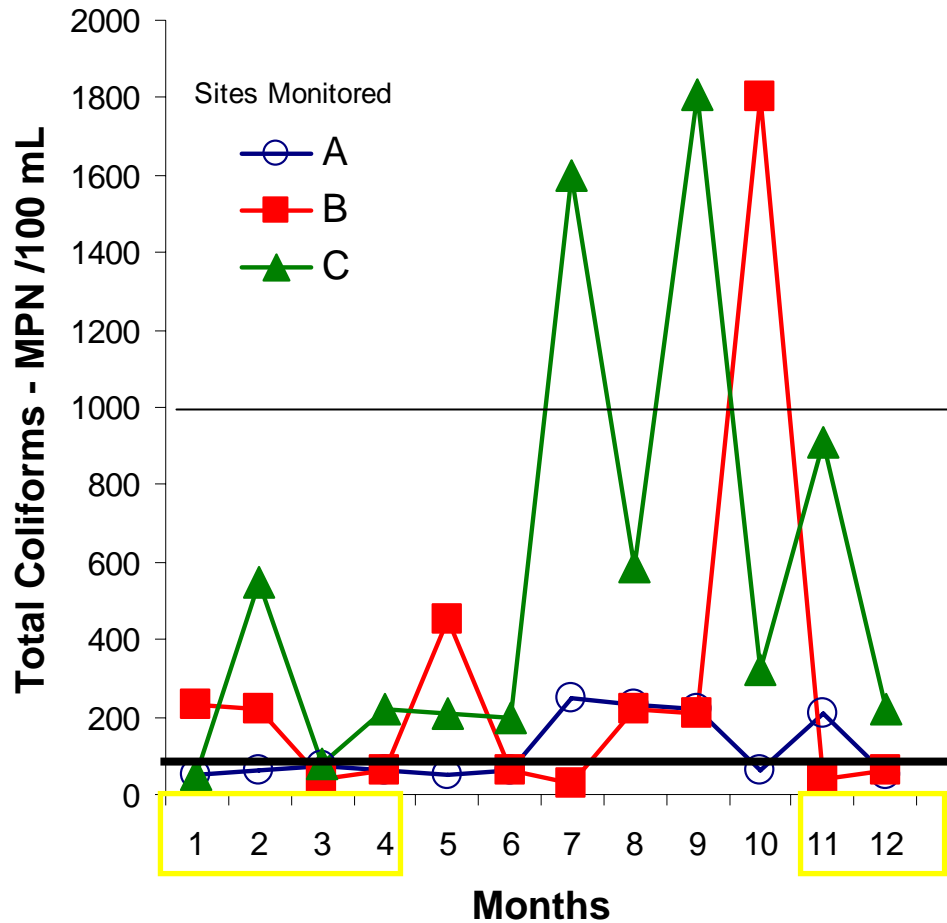
Different Ag Practices

- **Preparation of Soil: Sterilization of soil (e.g. Vapam) is not done in Yuma.**
- **Irrigation Water: Overhead sprinklers is not commonly used in Yuma (exception is baby leafy greens, grown on 84” beds, and some romaine).**
- **Nitrogen levels in fertilization program seem lower in Yuma than in Salinas (observation).**
- **Phosporic acid is commonly used in the Yuma area.**

Yuma Lettuce Production: Some Facts

- **Yuma leafy greens never implicated with any outbreak (a melon outbreak in the 80s is mentioned, no information available).**
- **Based on FDA information over 70% of the outbreaks have occurred during the months of July through November.**
- **In 2003, in an informal survey to 10 top AZ growers (American Vegetable Grower) only 1 would monitor water quality. Currently, this has changed. Two local labs in place provide service for bacteria indicators analyses.**

Surface Water Quality (Imperial County)



Source: T. Suslow, 2005

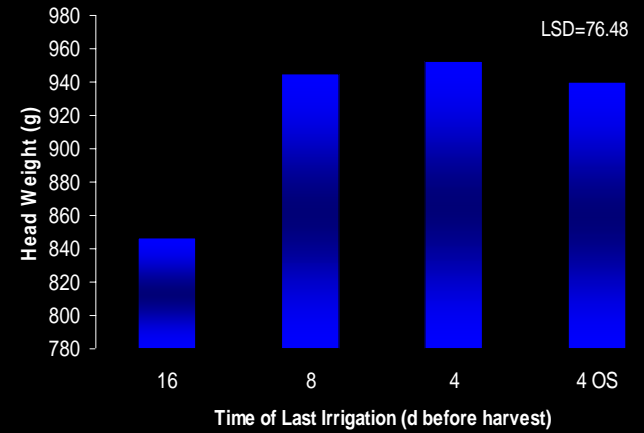
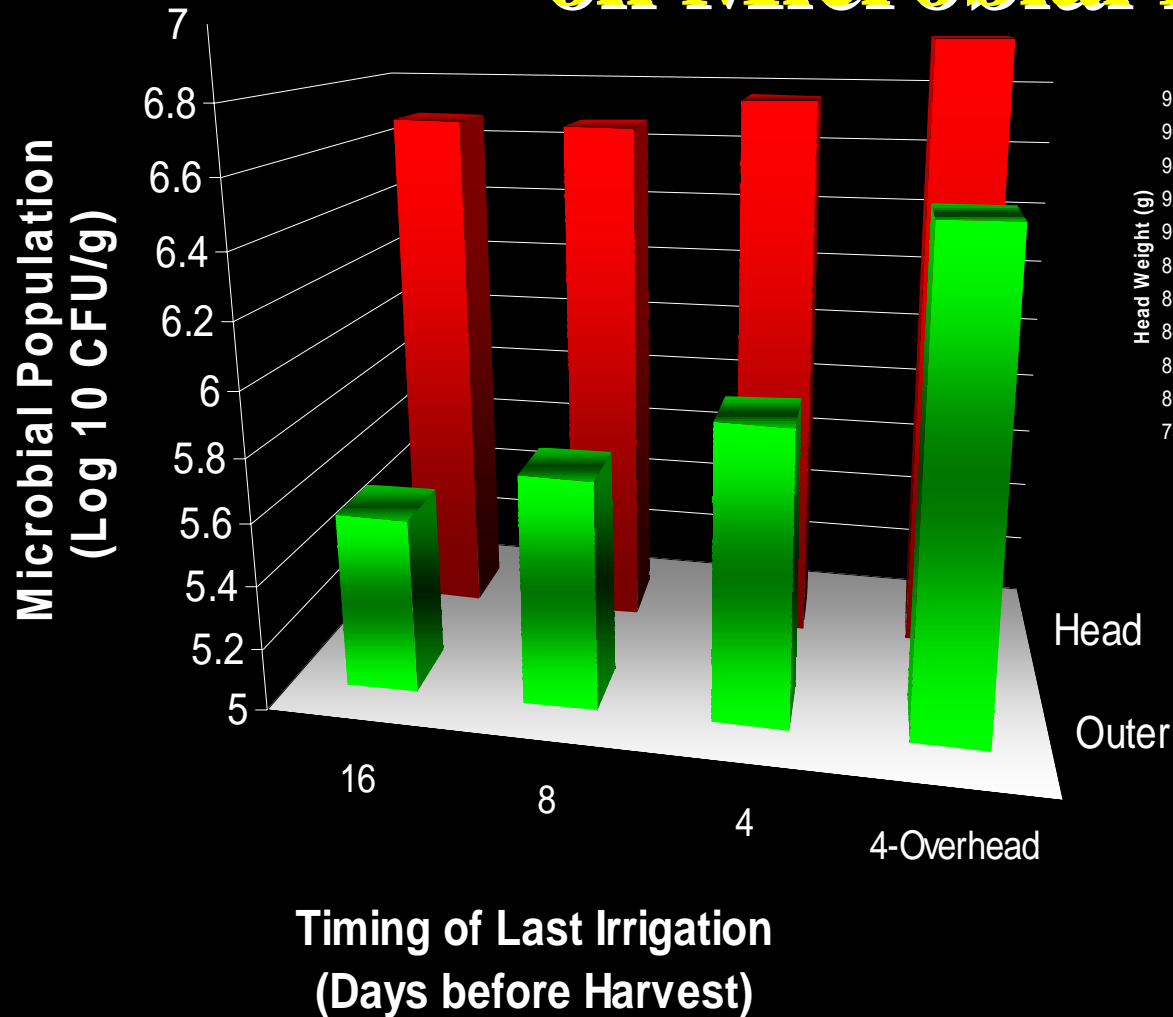
http://ucce.ucdavis.edu/freeform/UC_GAPs/documents/Extension_Presentations1920.pdf

Vegetable Production In Yuma

- **With exception of migratory birds very few wild animals roaming fields (observation)**
- **No forest nearby fields**
- **Only one cattle ranch close to a land that is being farmed (but several sites with domestic animals nearby fields)**



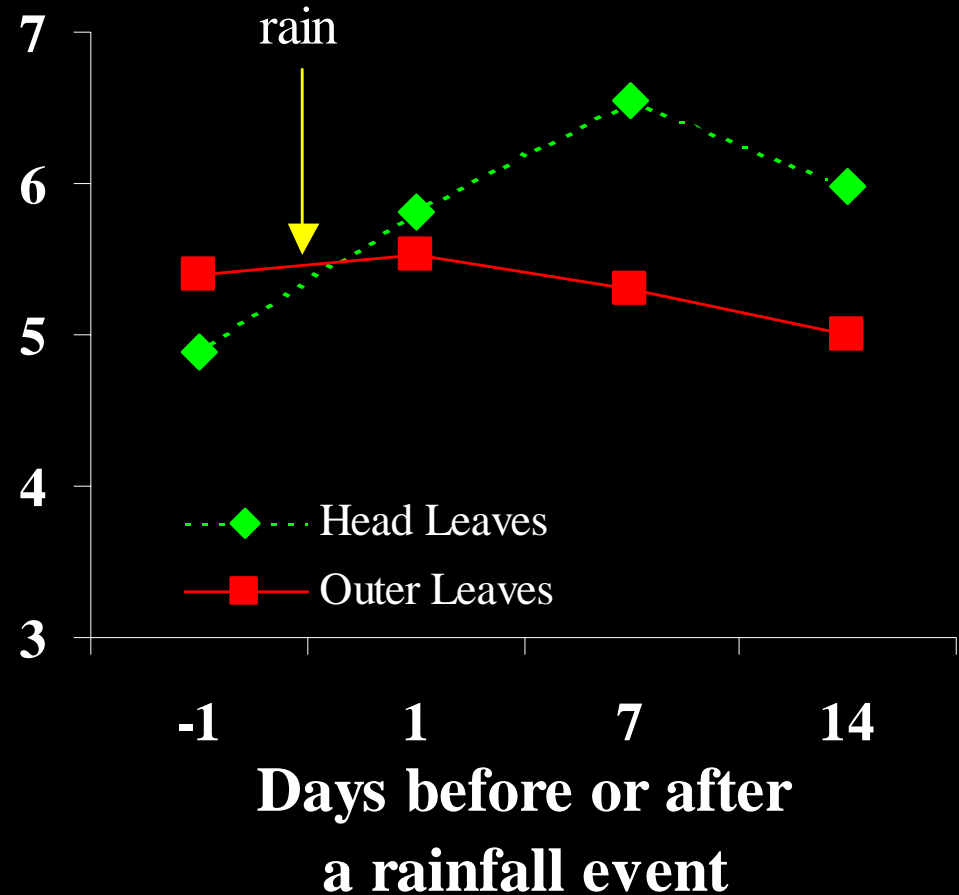
Effect of Termination Irrigation on Microbial Population



Effect of Rain on Mesophilic Bacteria Load

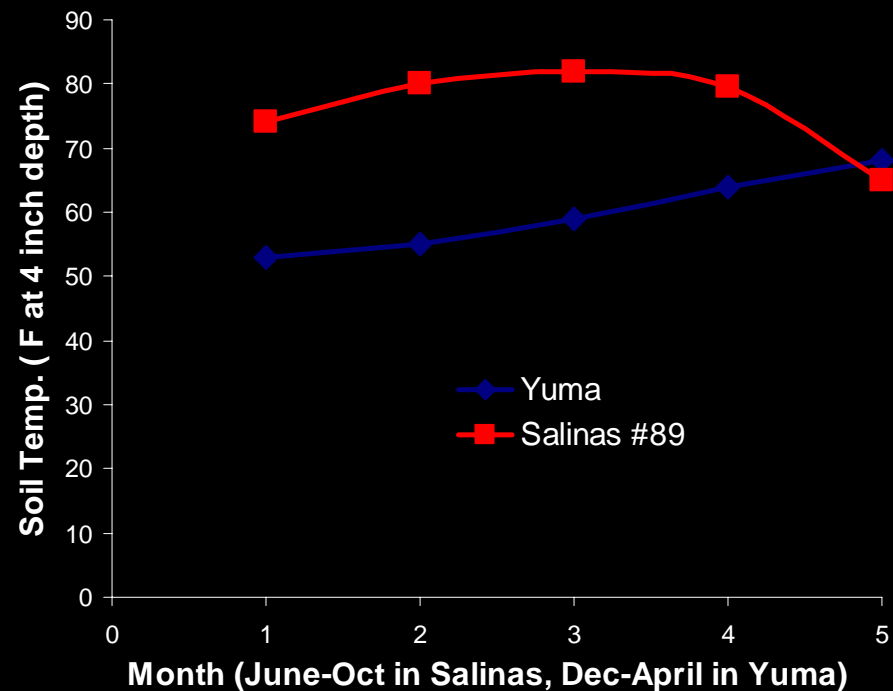
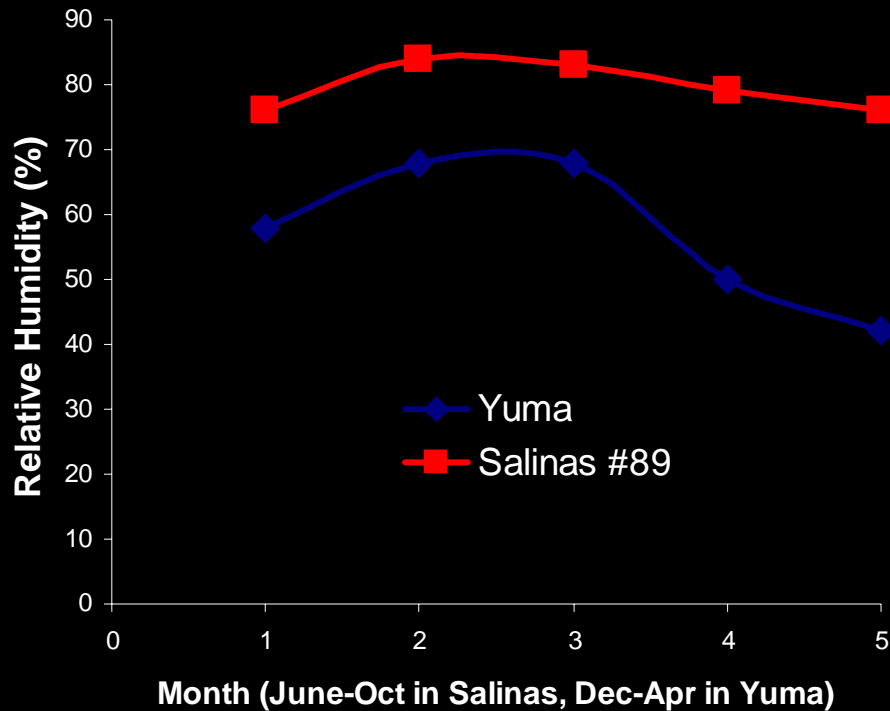


Microbial Population
(Log₁₀ CFU/g)



Environmental Conditions in Yuma differ from those in Salinas

Relative humidity and soil temperature in South Salinas and Yuma during the leafy vegetable season



Low temperature during December/January



'In Arizona crews had to wait up to six hours on some days to harvest because of ice on lettuce; this caused variable quality during December'
Jan., 2006 – US Dept. Agriculture



Environmental Conditions During Harvest Season in Yuma

- **Water quality: Almost 100% of the growers source water from Colorado river**
- **Water quality: High content of salt in water**
- **Daily sunlight in Yuma appear lower than most places but day length differs (effect?)**
- **In general soil temperature is lower in Yuma**
- **In general relative humidity is lower in Yuma**

On-going and Future Research

- **Study to monitor water in irrigation canals and determine any possible abiotic/biotic factors that correlates with bacteria population fluctuation**
- **Survival rate of pathogen under different conditions**
- **Sanitizing alternatives to chlorine**



Some Remaining Questions

- **No information about monitoring of *E. coli* O157.H7 in domestic animals in the Yuma area**
- **Private lab has not confirmed the rumor that *E. coli* O157.H7 was found once in the river/canal. Other pathogens have been found (work by Gerba et al.), but little is known about fate of pathogens in real conditions**
- **A feasibility study has not been done on the potential use of sanitizers in the water**