

Investigating Fungicide Rainfast Characteristics

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Rainfast Characteristics Fungicides and the Effect on Cherry Leaf Spot Efficacy

- **Hypothesis:** After a wetting event, fungicide residues vary based on chemistry and that rate of residue wash-off influences leaf susceptibility to CLS
- **Objectives:**
 - Determine rainfast characteristics of CLS fungicides
 - Evaluate CLS susceptibility of leaf tissue with different fungicides and rainfall amounts

Methods

- Single tree treatments were applied to 15-yr-old Montmorency in randomized complete block design:
 - Bravo[®], Pristine[®], Gem[®], Dodine + Captan, Cuprofix[®] Ultra 40 Disperss[®], and UTC
 - Sprays were applied to run-off (equivalent to 300 gal/A) at 300-350 psi
- Branch and spur samples were collected from each treatment after the fungicides had dried
- Samples were placed in a *Generation 3 Research Track Sprayer* to simulate exposure :
 - 0", 0.1", 0.5", and 1" rain



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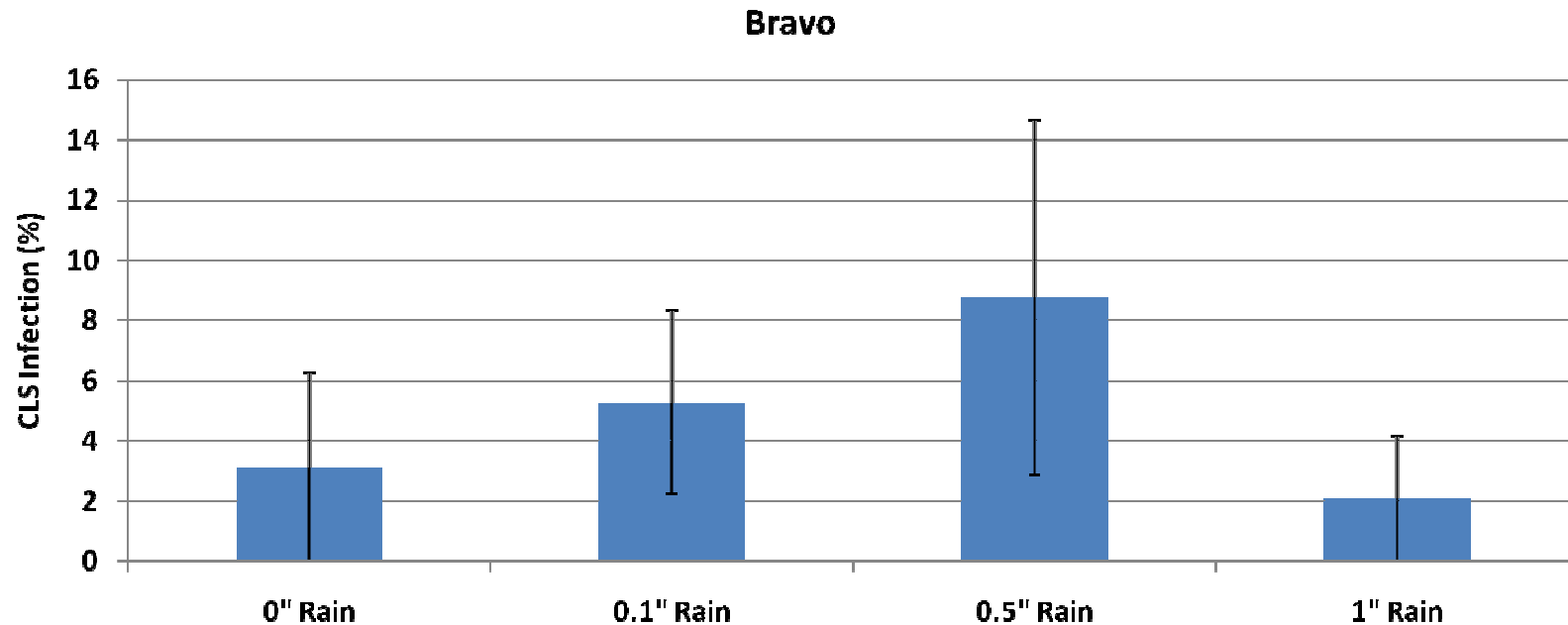


Methods, cont.

- Residue samples were analyzed to determine impact of rainfall on fungicide residue
- Bioassays were conducted by exposing treatments to *B. jaapii* spores
 - Inoculated samples were placed into one-quart plastic containers with a lids
 - Treatments were evaluated every 4 days

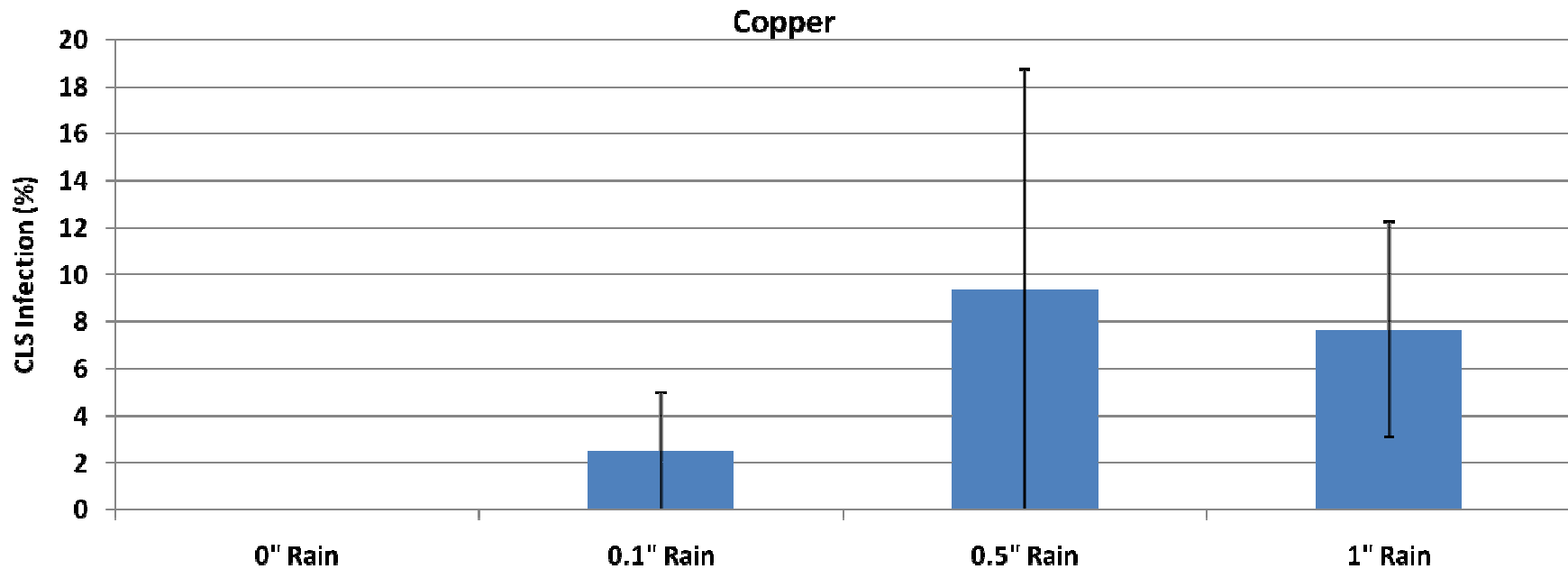


Bioassay Results



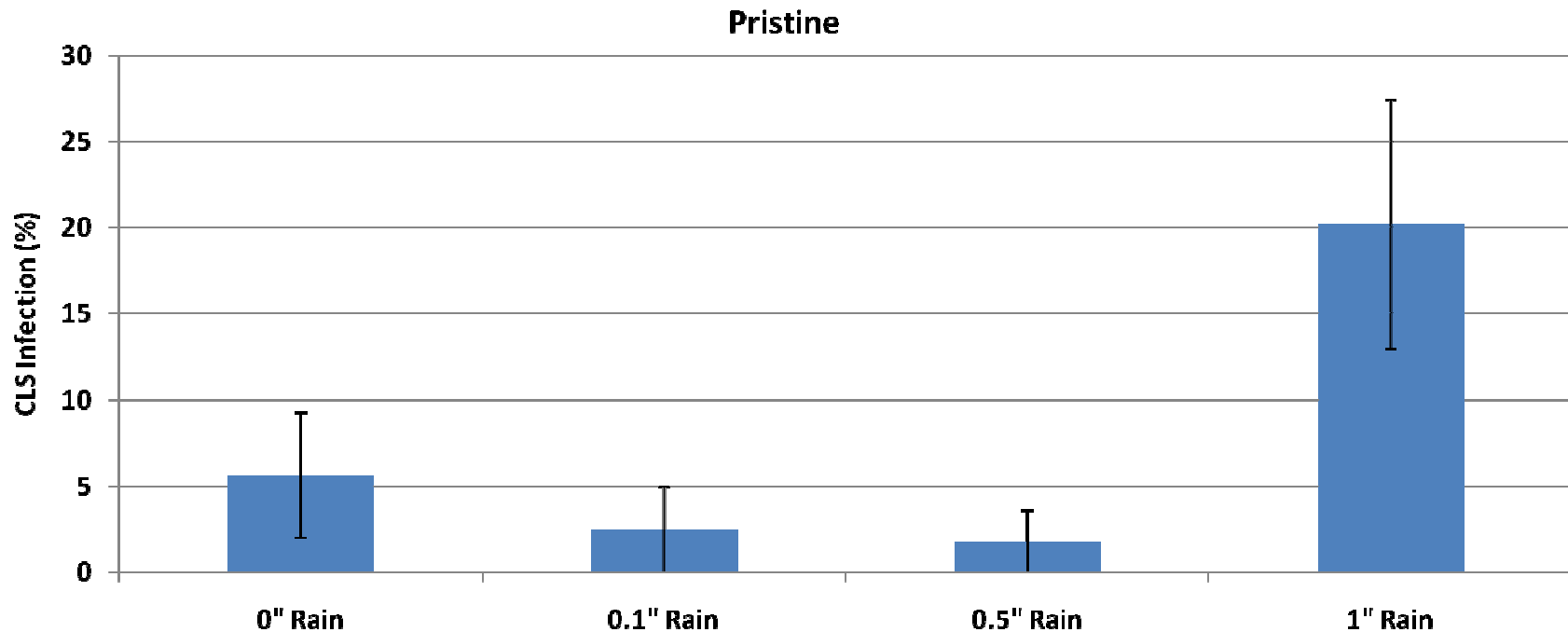
- There were relatively low infection levels in Bravo treated samples
- There was no significant decline in performance based on rain exposure

Bioassay Results



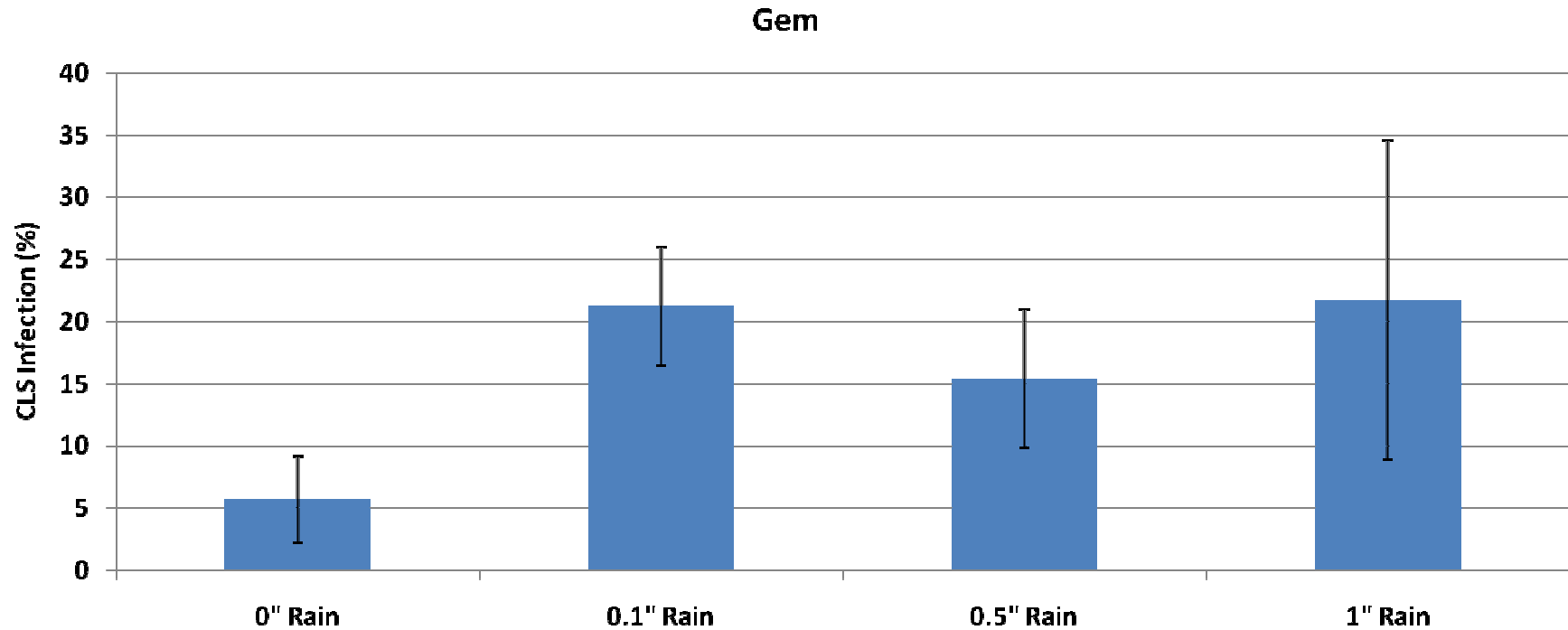
- Copper completely suppressed infection when not exposed to rain
- Copper lost efficacy as rainfall increased but overall remained one of the most effective treatments

Bioassay Results



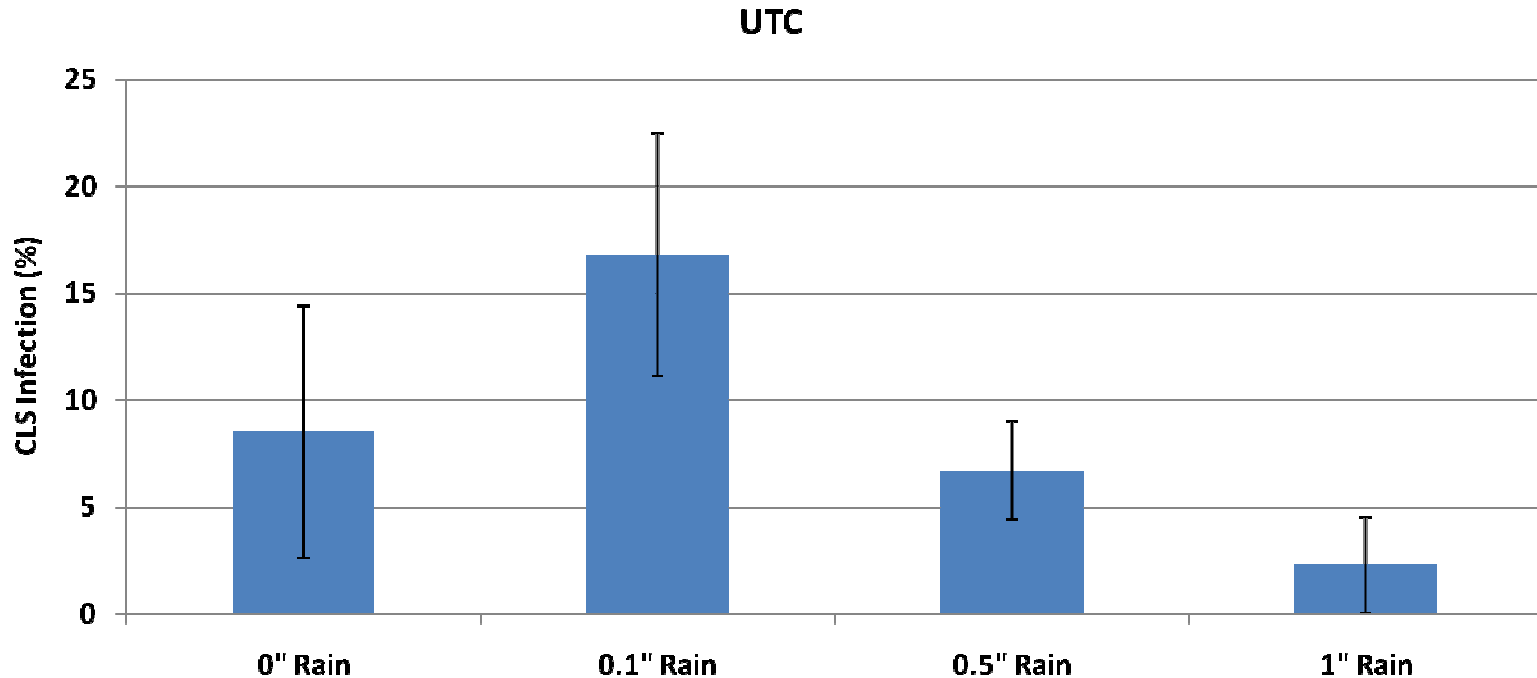
- Pristine (Strobilurin, boscalid mix) locally systemic and true systemic
- Pristine performed well, but lost significant efficacy after exposure to 1" rain

Bioassay Results



- Gem (trifloxystrobin) is surface systemic
- Gem efficacy broke down significantly at 0.1" rainfall

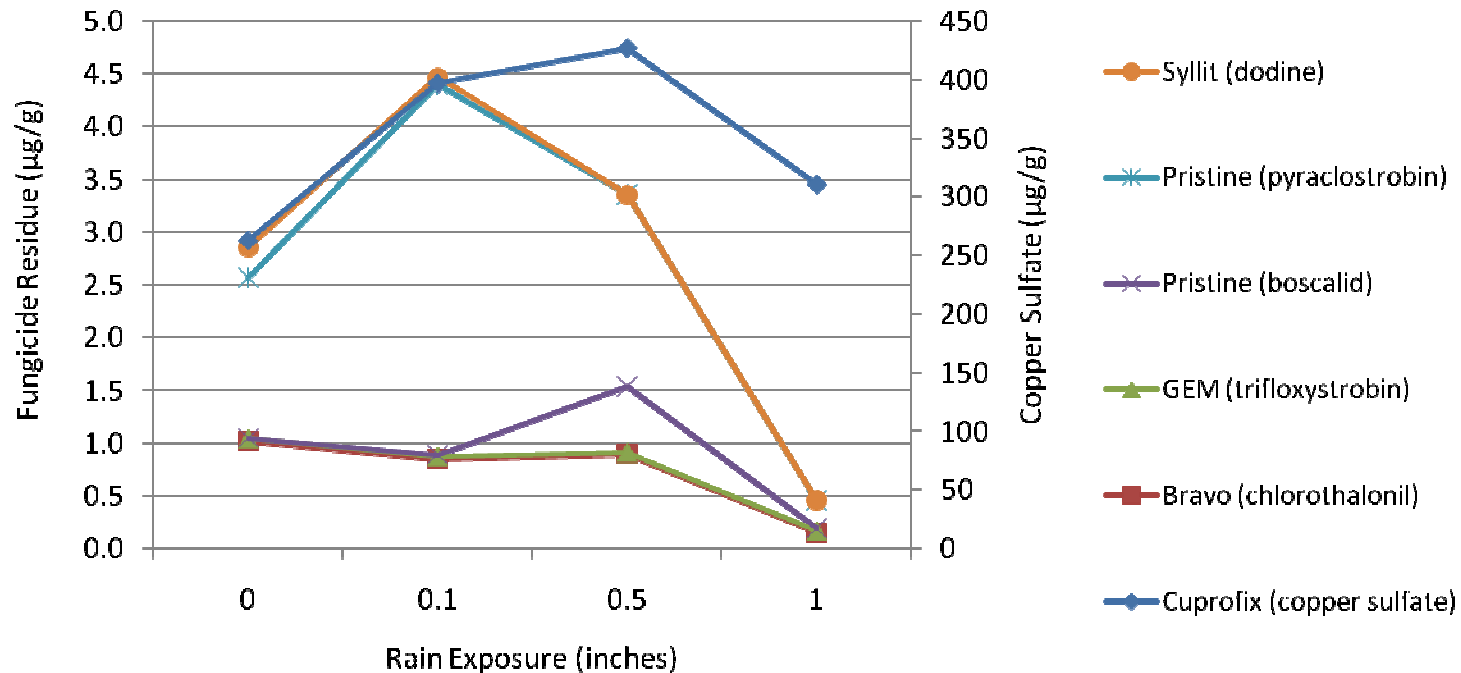
Bioassay Results



Samples receiving no fungicide treatment showed variable levels of infection from 3-17%!

Residue Results

Figure A. Residue of a.i. Based on Rainfall Exposure

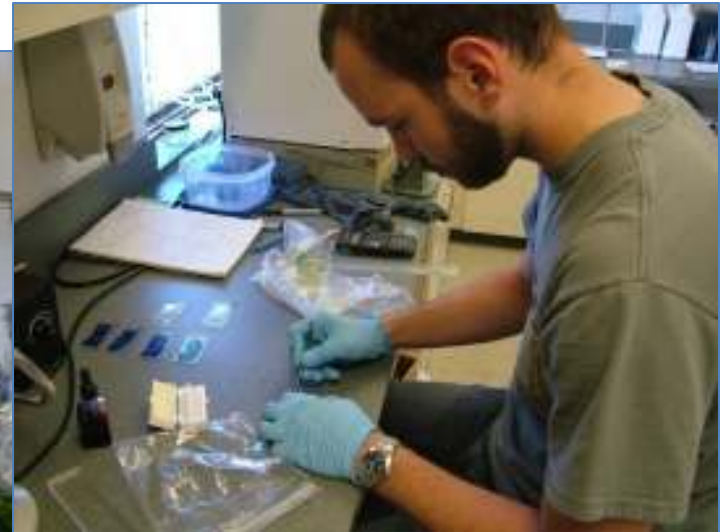


- Confounding results from the residue tests
- Increasing to multiple replicates may better illustrate residue behavior
- Considering surface vs. interior residues may better describe residue
- Very dilute applications may also have contributed to these results

Conclusions

- The idea that loss of residue can be directly correlated to decreased efficacy may be flawed:
 - Differences in mode of action (locally systemic, systemic etc, surface vs. interior residue)
 - Differences in potency
- Increasing to multiple replicates for residue testing may better illustrate sample variability
- Testing a broader range of rainfall may help define when loss of significant residue and efficacy occurs
- Increasing overall sample size to a much larger scale will be necessary to minimize variation and develop a more statistically significant and robust data set

Thanks!



- **Michigan Cherry Committee**
- Dr. John Wise
- Dr. Nikki Rothwell and Dr. George Sundin
- Karen Powers, the summer crew, and Bill Klein