

Soil Disinfestation With Steam for Disease and Weed Control

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Acknowledgments

- **Yu-Chen Wang & Alex Putman**
- **California Leafy Greens Research Program**
- **Cooperating Growers**
- **Propane Education and Research Council**

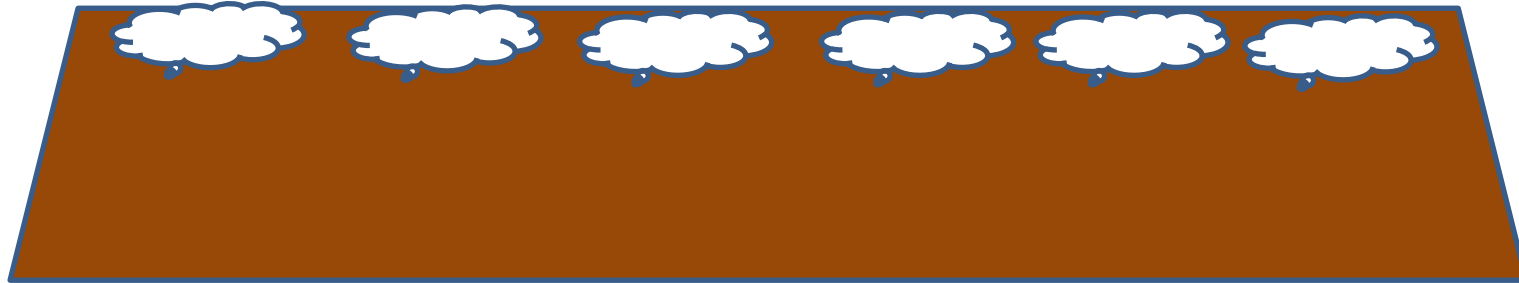
Targeted crops for steam

- **Vegetables – carrot, lettuce, spinach**
- **Strawberry**
- **Field grown flowers**

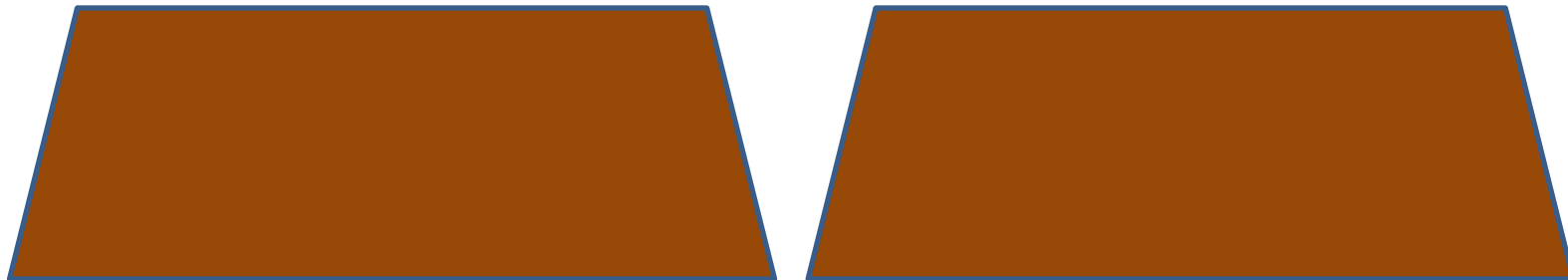


Steam application methods

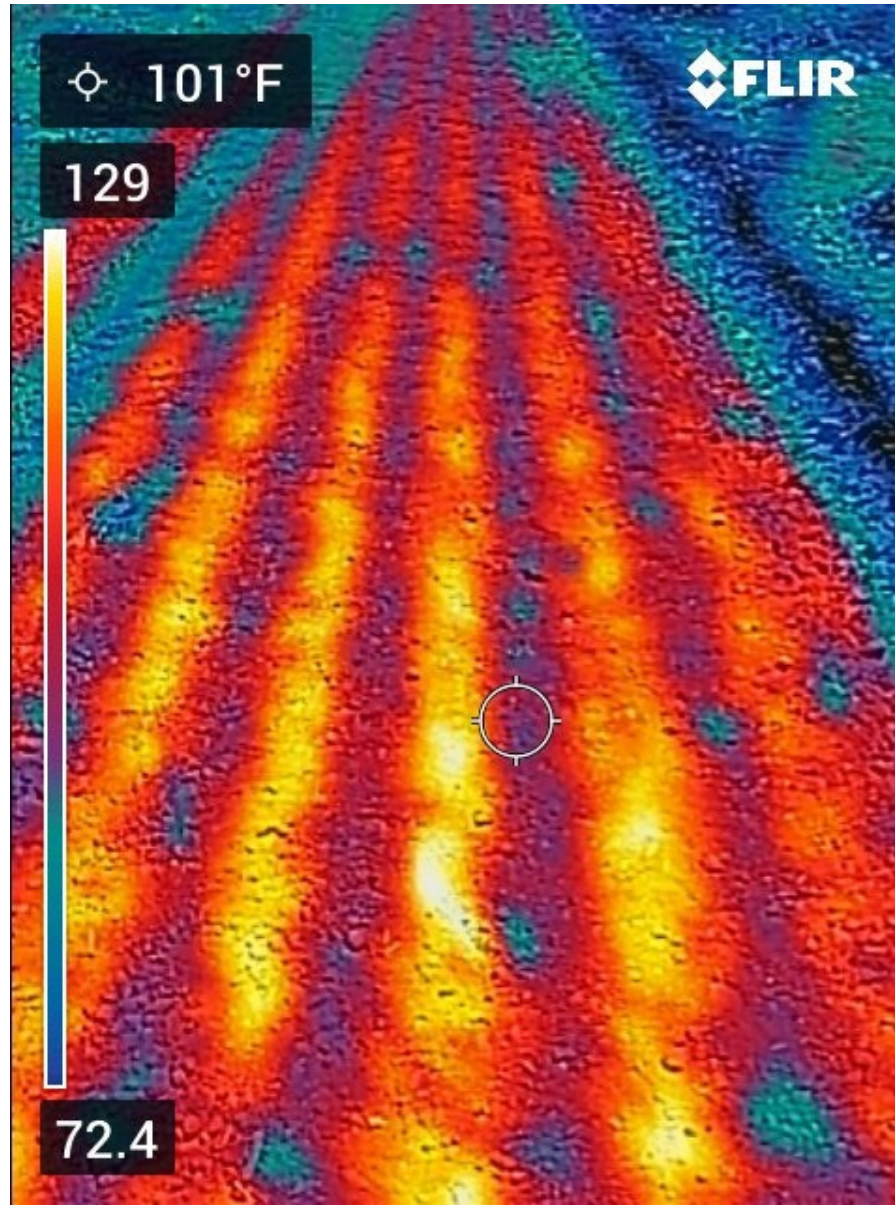
Fallow 80-inch bed - lettuce & spinach



Fallow 40-inch beds - carrot, lettuce



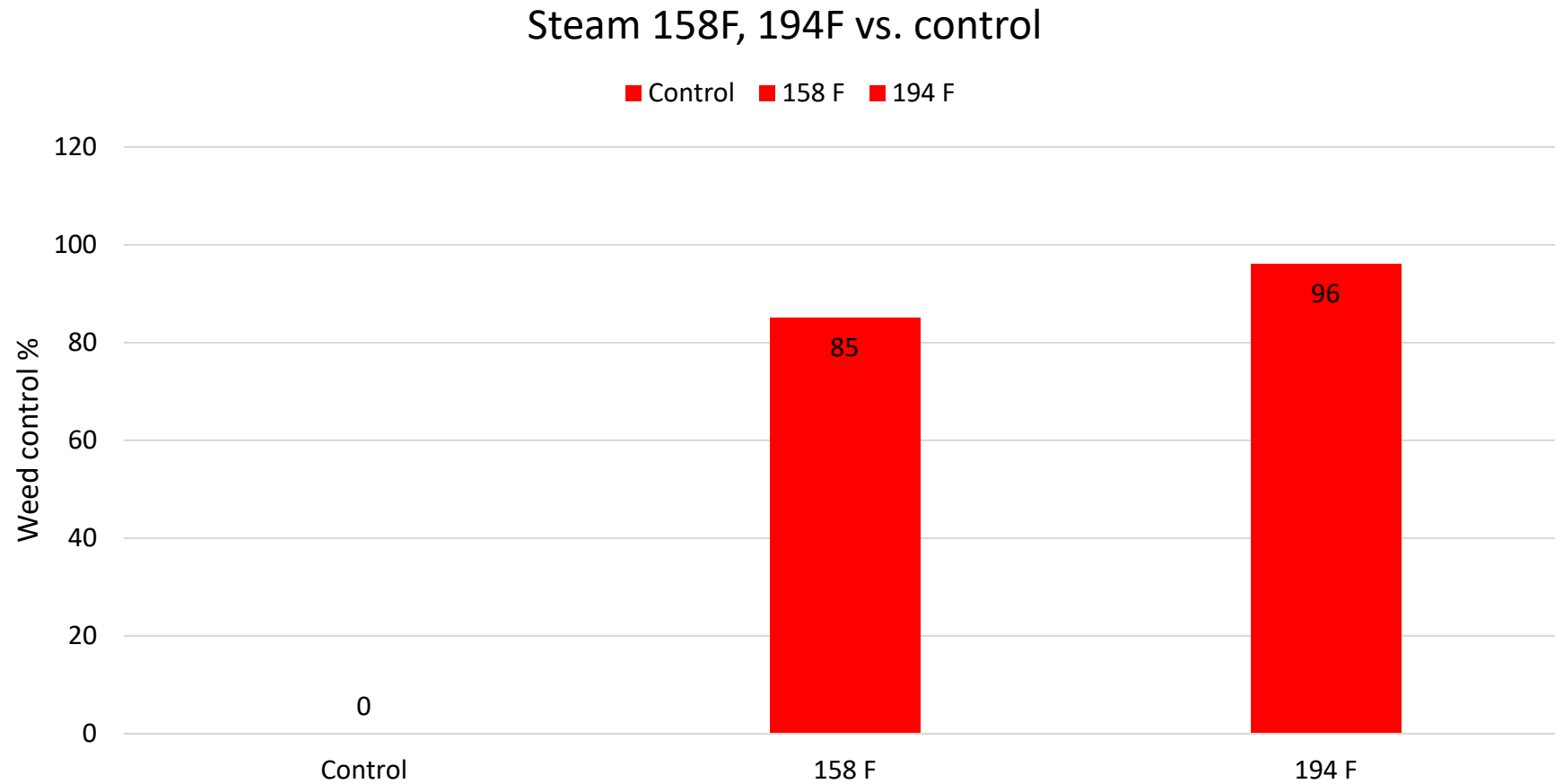
Infrared image of soil



Soledad & Greenfield Trials

- **80-inch beds - entire bed top was steamed.**
- **Soledad trial - steam applied June 18, 2025**
- **Greenfield trial - steam applied June 25, 2025**
- **Treatments were steam 158°F, 194°F and control (no steam). Replicated 4 times**

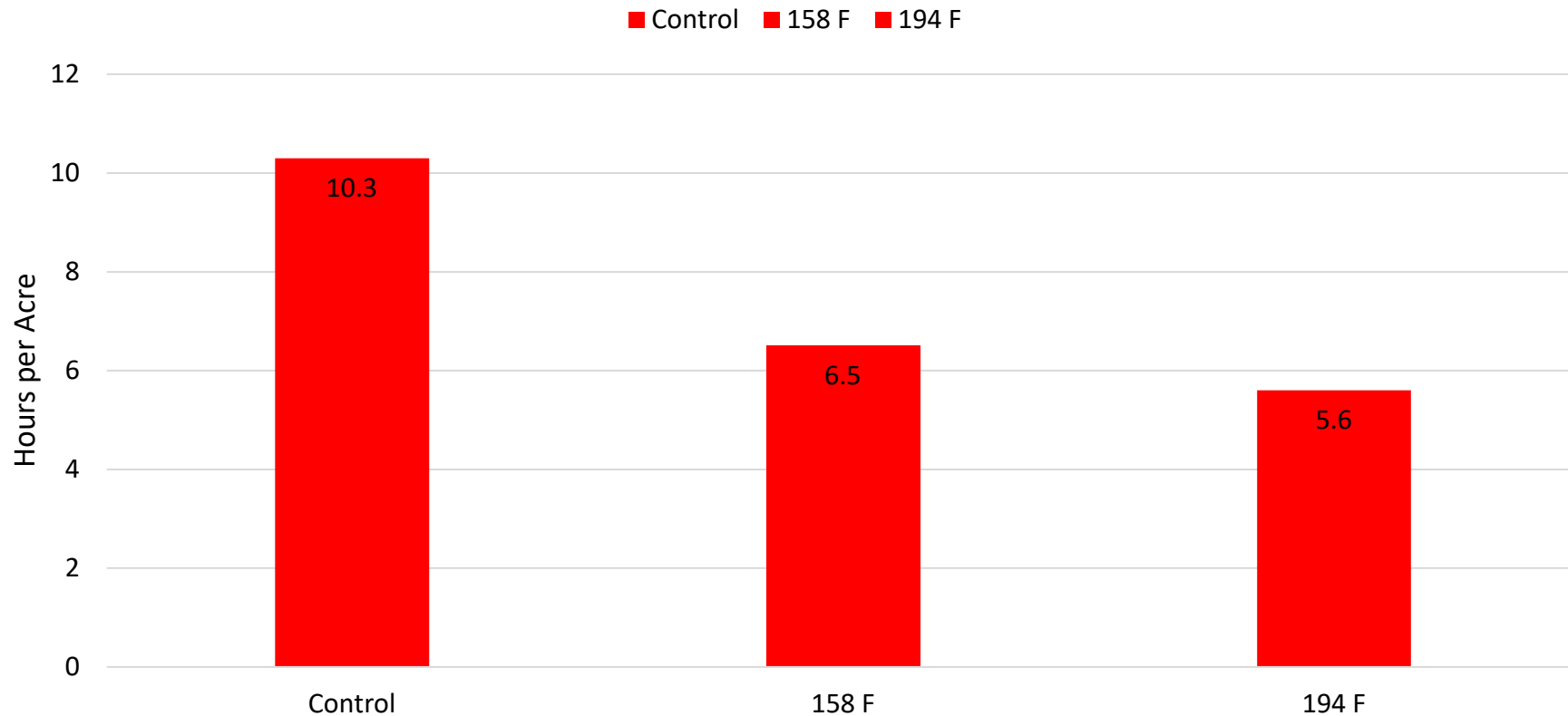
Weed control % with steam Greenfield, CA



June-July 2025

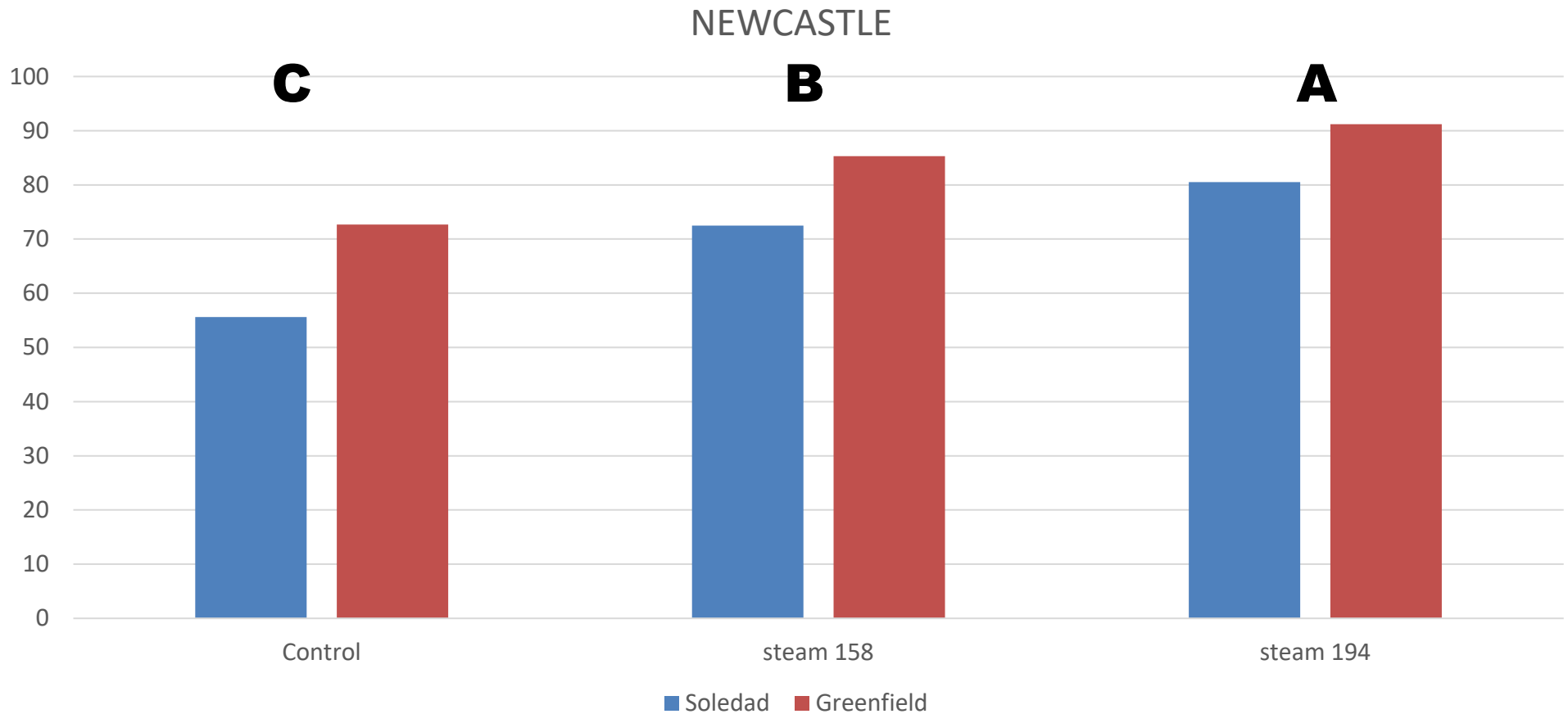
Hand weed time hours/A with steam Greenfield, CA

Steam 158F, 194F vs. control



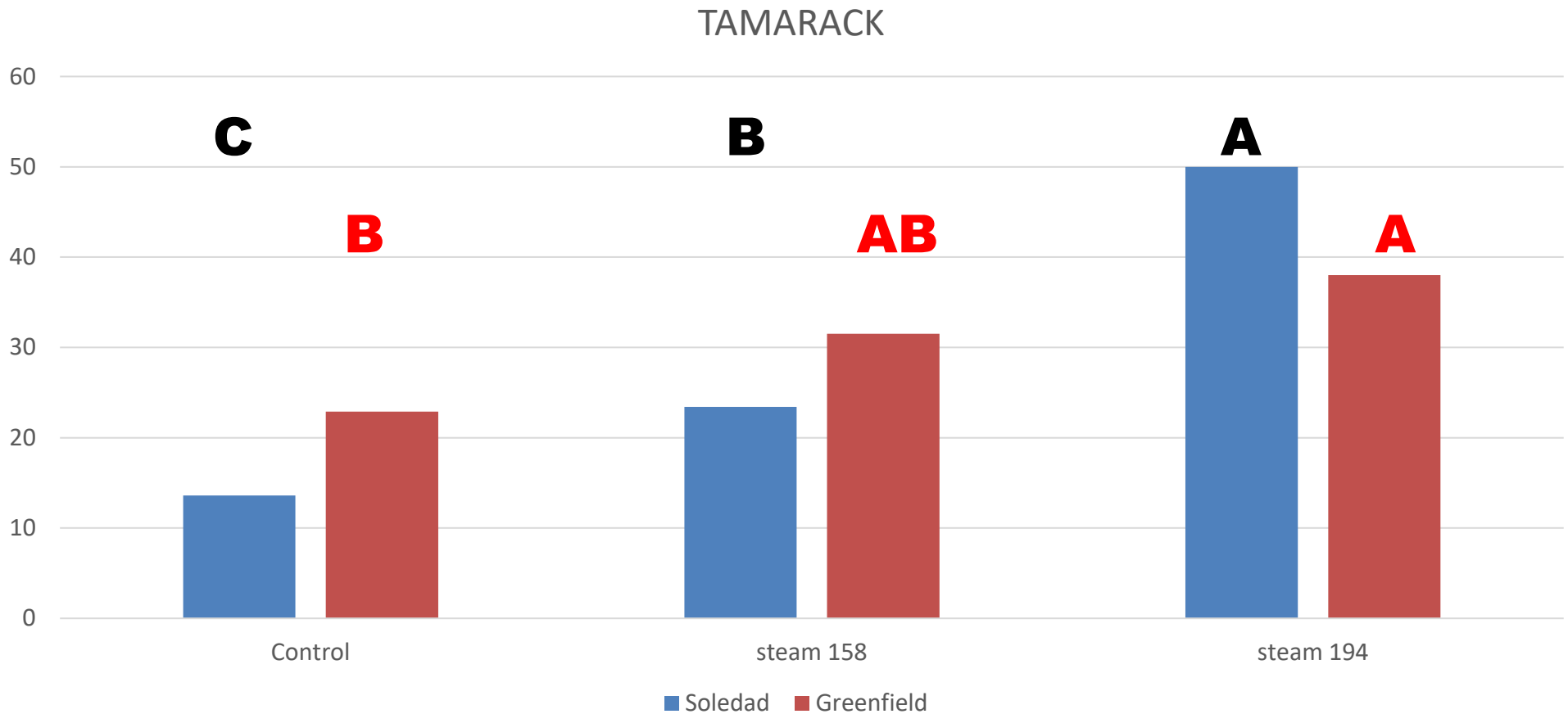
June-July 2025

Marketable lettuce %



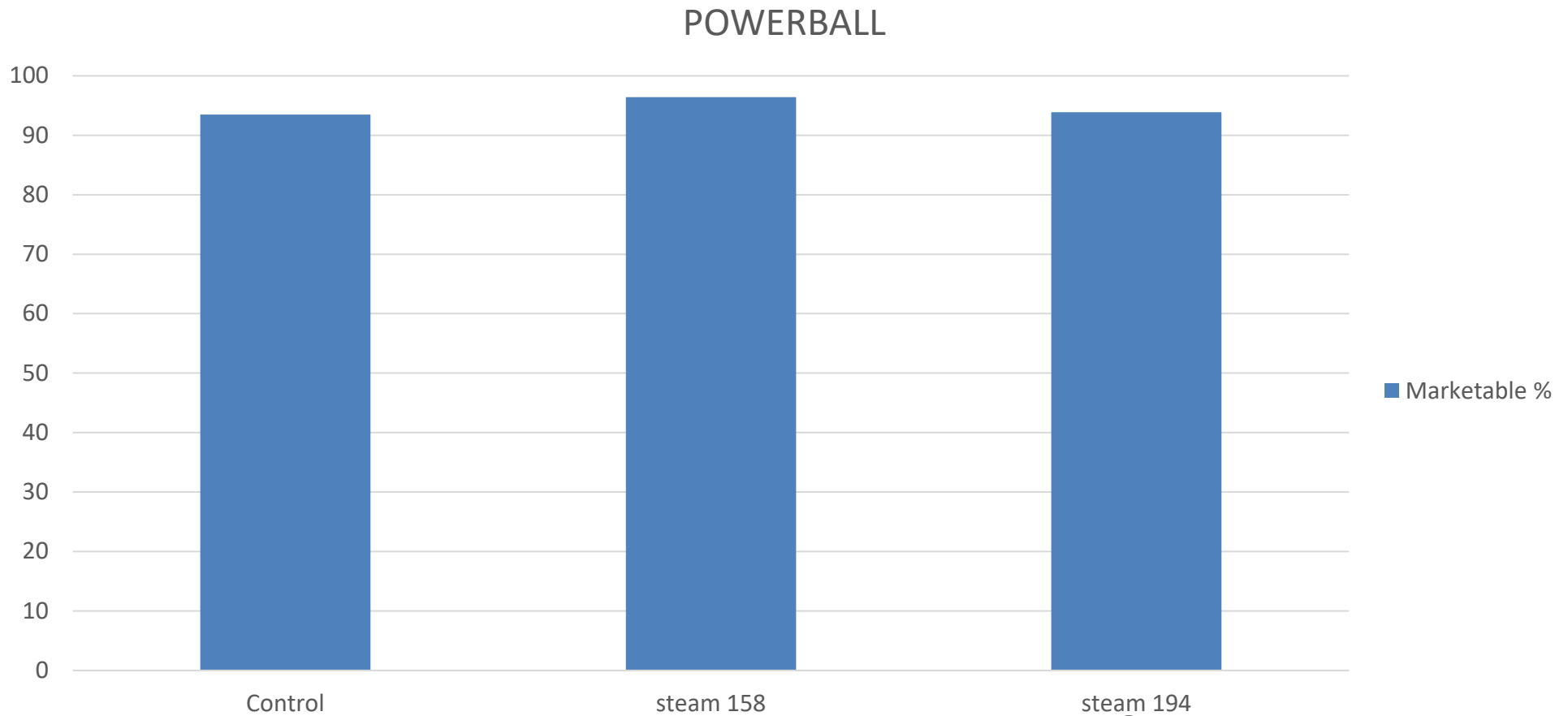
Soledad &
Greenfield 2025

Marketable lettuce %



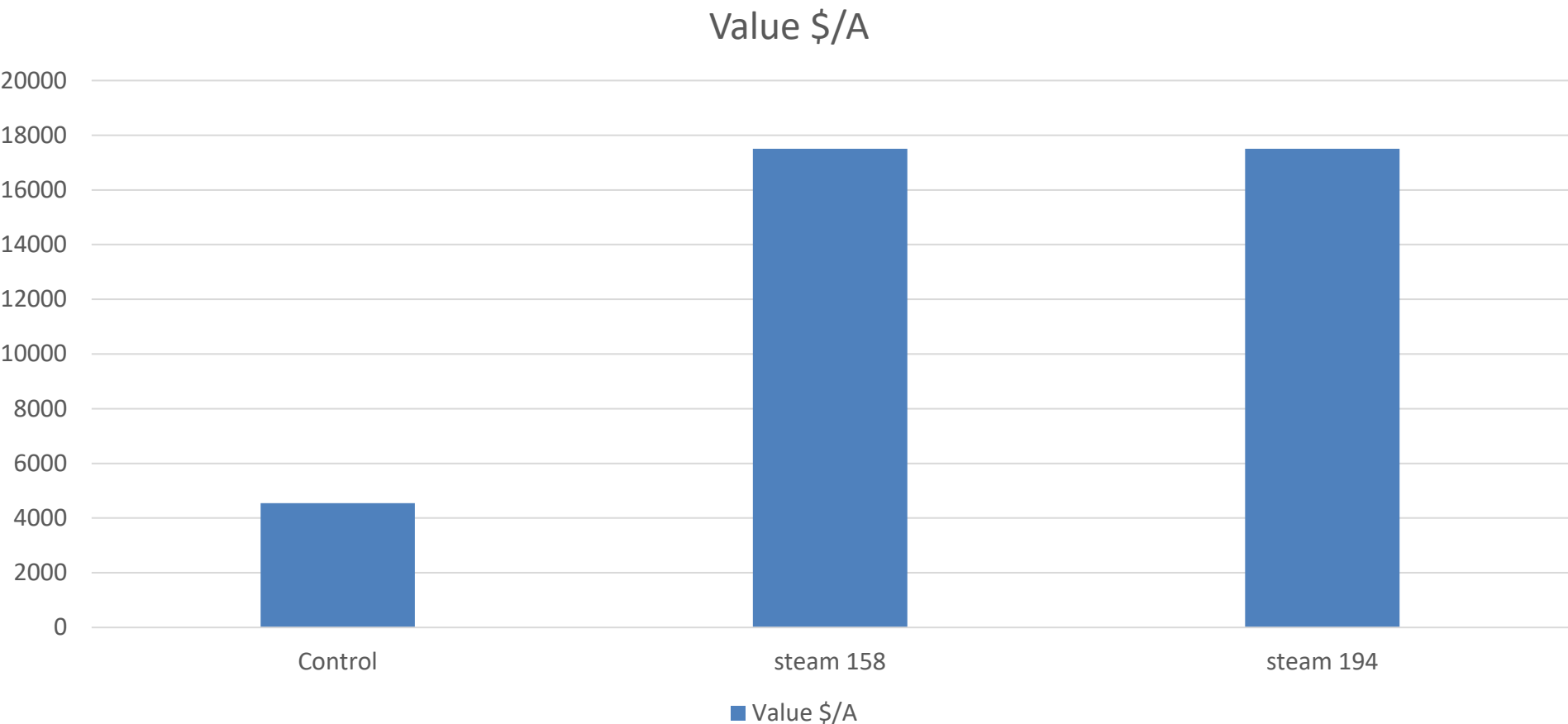
Soledad &
Greenfield 2025

Marketable lettuce %



Soledad 2025

Lettuce harvest in Fusarium plots Value \$/A



Spreckels site 2024

Impact of steam on soil microbial communities

- **The impact of steam on soil microbial communities has been a concern in the past.**
- **MS student Erika Escalona has conducted research on the impacts of band steam on soil microbial communities.**
- **The data suggest that properly applied steam causes a shift in microbial communities which quickly recovers.**

Conclusions

- **Steam suppresses Fusarium & Weeds**
- **Steam suppresses lettuce drop & Verticillium**

Moving forward

- ❖ We are working with a startup to form an engineering company
- ❖ We are working to improve the design, and lower the machine & operation costs
- ❖ The machines would be available to purchase or lease
- ❖ Current efforts are directed at strawberry



New
strawberry
steam
applicator