

Christopher Toy

*Managing Agrivoltaic
Systems for
Ecosystem Services*

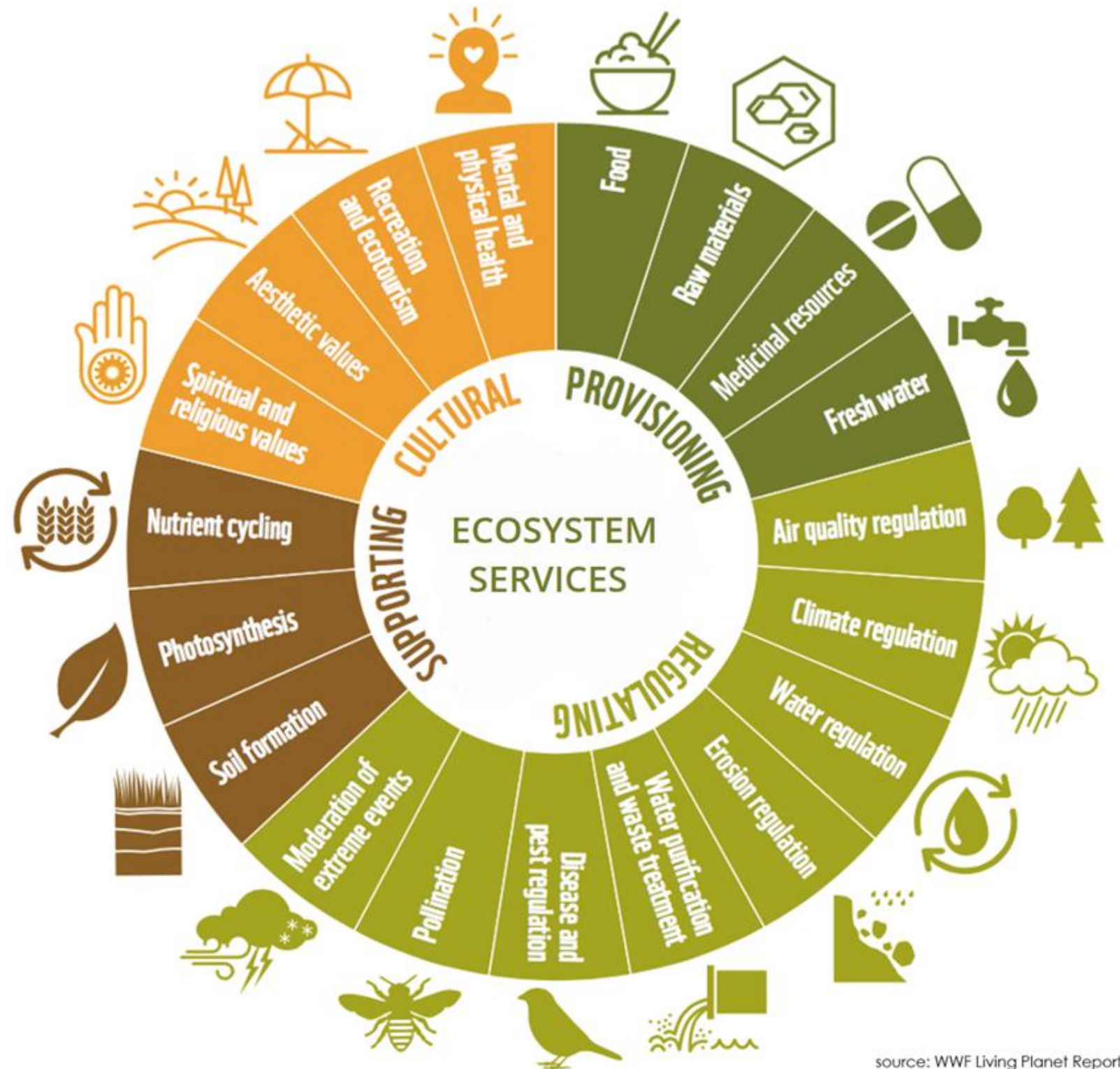
Colorado State University

Department of Soil and Crop Science

Advisor: Dr. Meagan Schipanski

What are Ecosystem Services?

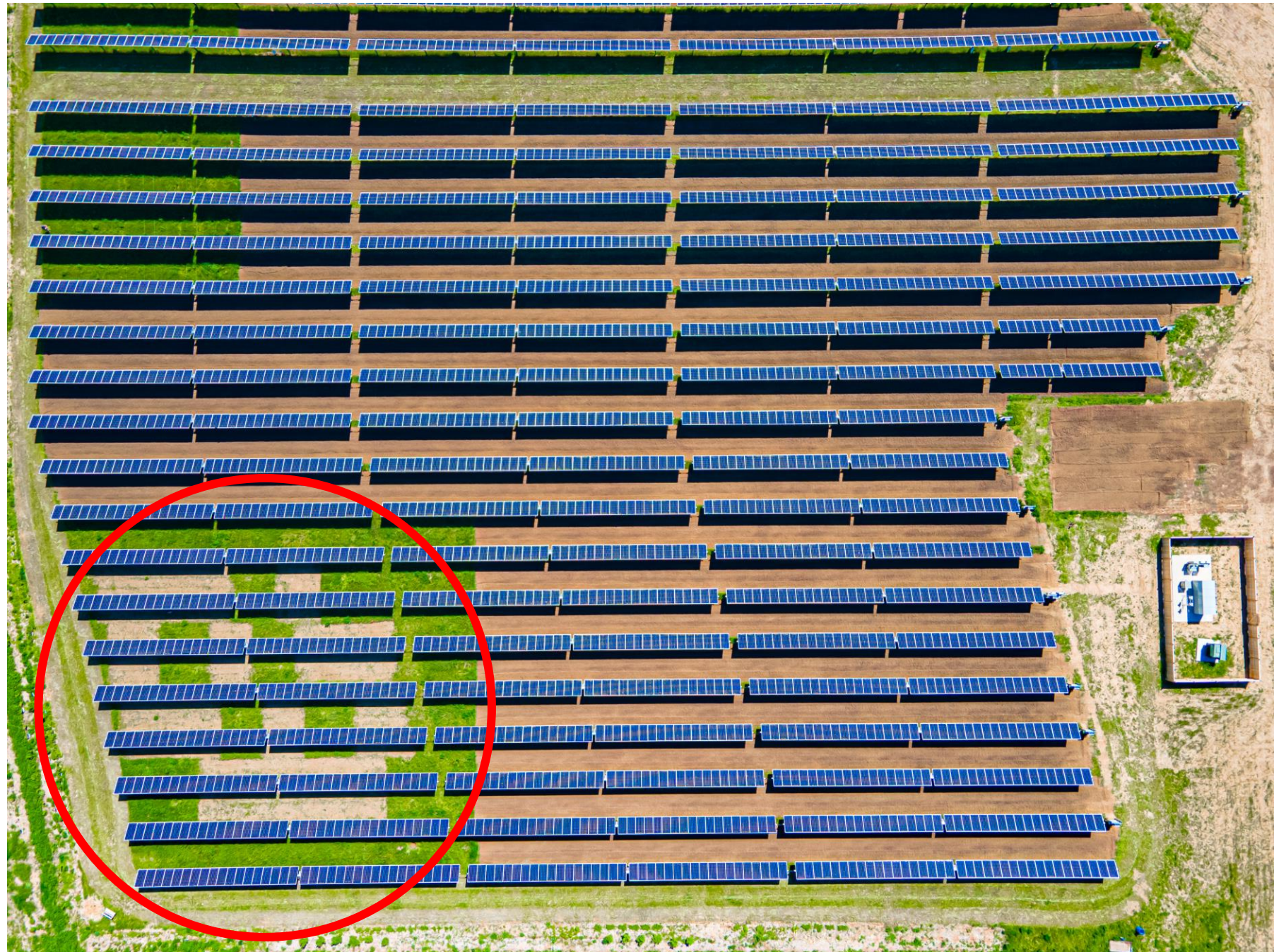
Ecosystem services are any benefits that humans derive, directly or indirectly, from ecosystems



source: WWF Living Planet Report 2016

Context: Jack's Solar Garden

- A five acre, 1.2 MW community solar garden in Longmont, CO
- Energized Autumn 2020
- First agricultural and research season in 2021
- Historically a 24 acre family farm growing hay



Pasture Vegetation



Native Vegetation: Wildflower Dominant



Native Vegetation: Wildflowers and Grasses



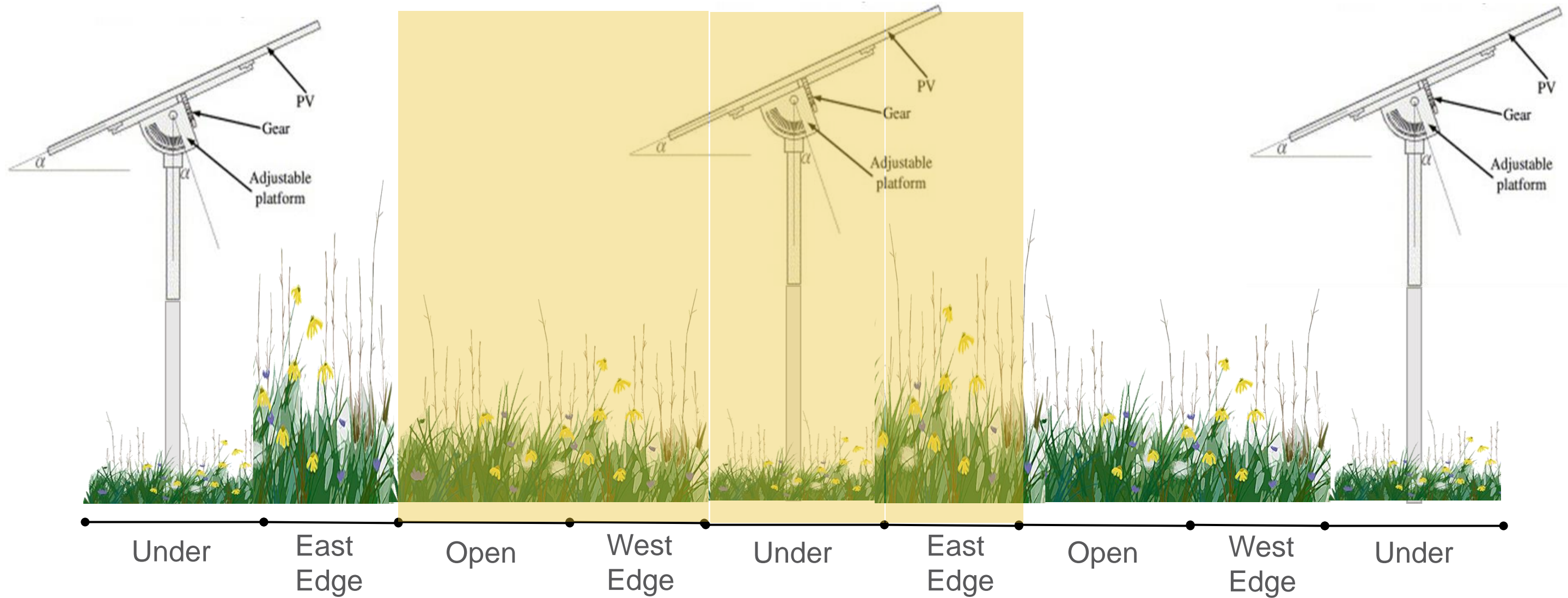
Dryland



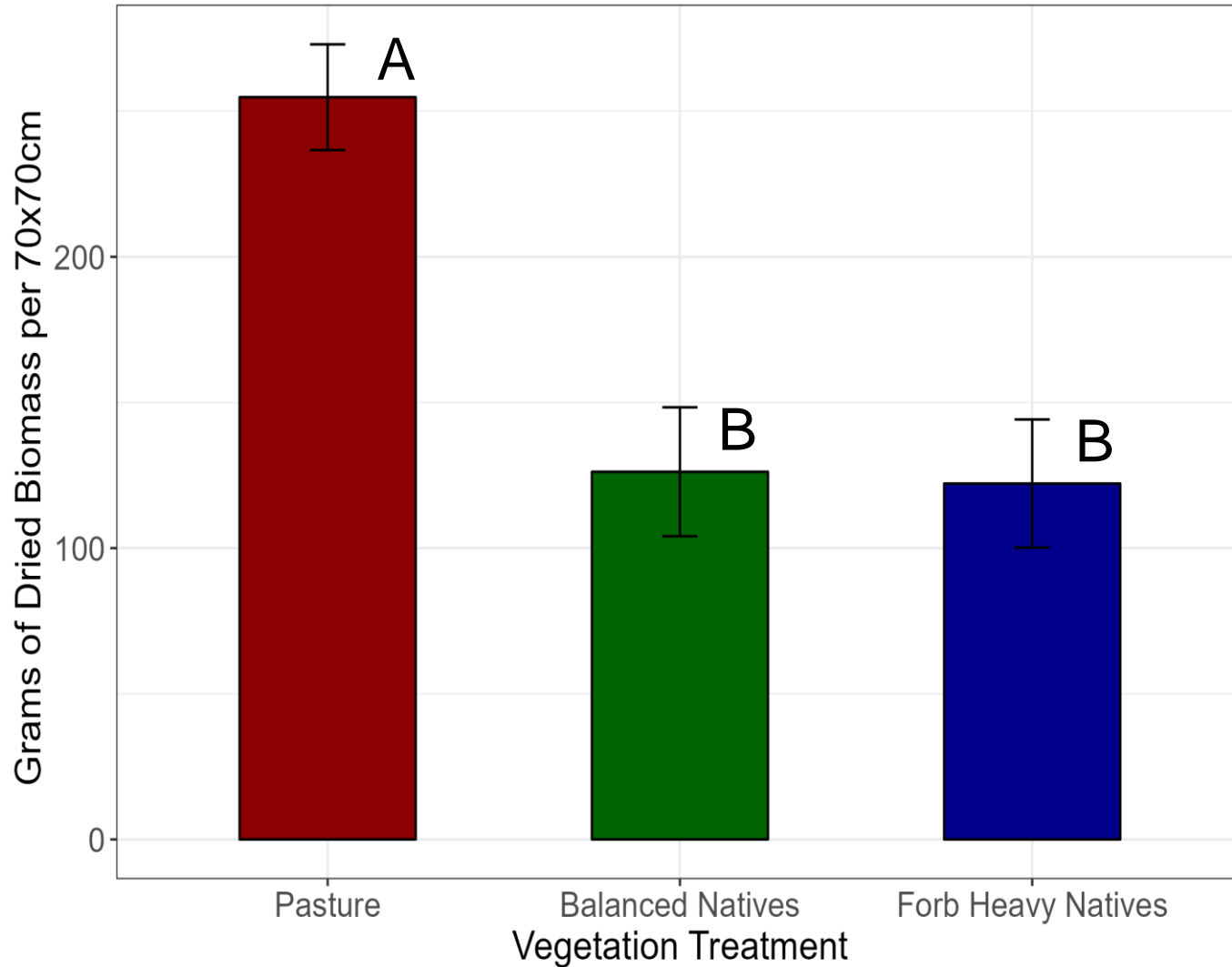
Drip Irrigation



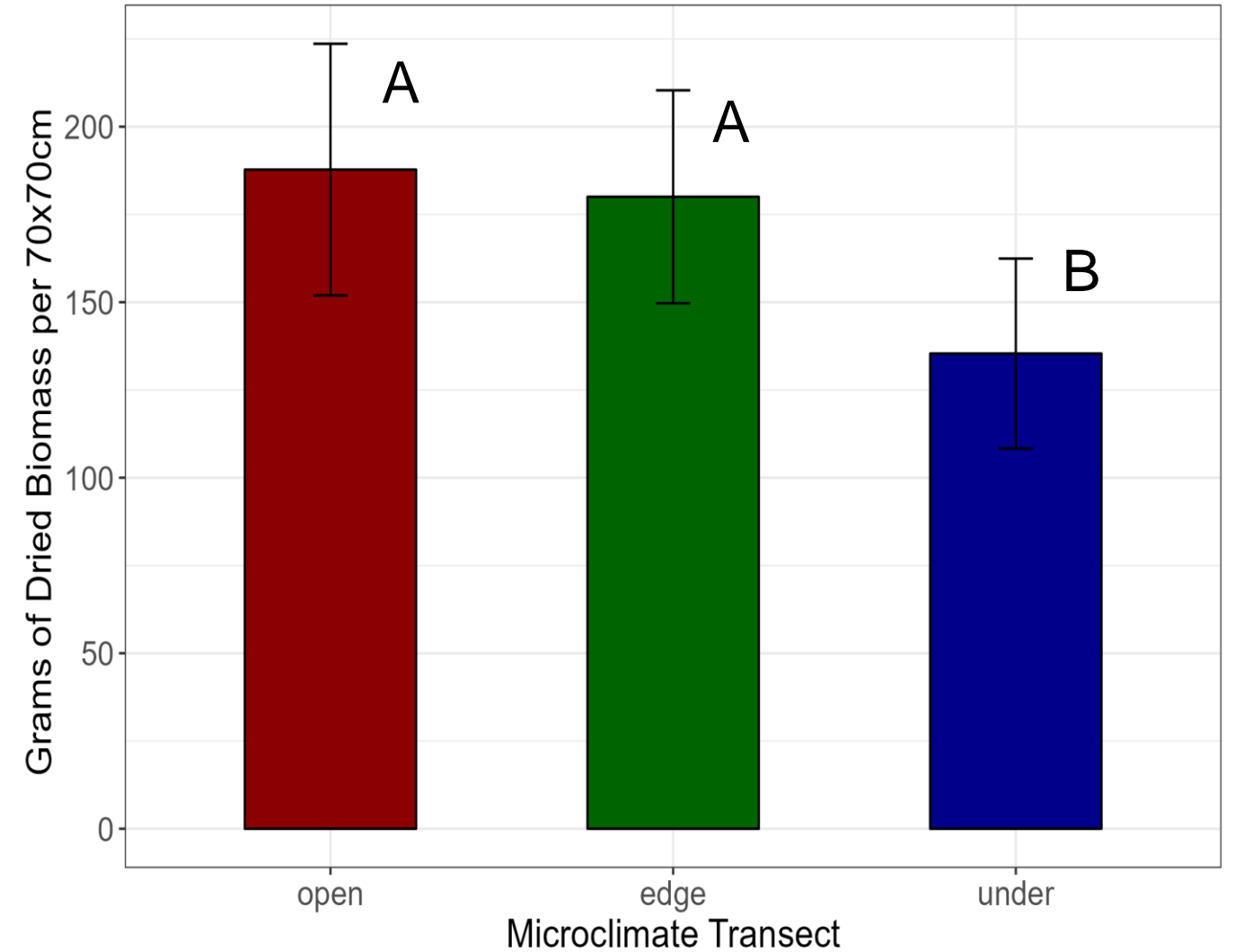
Microclimate Zones



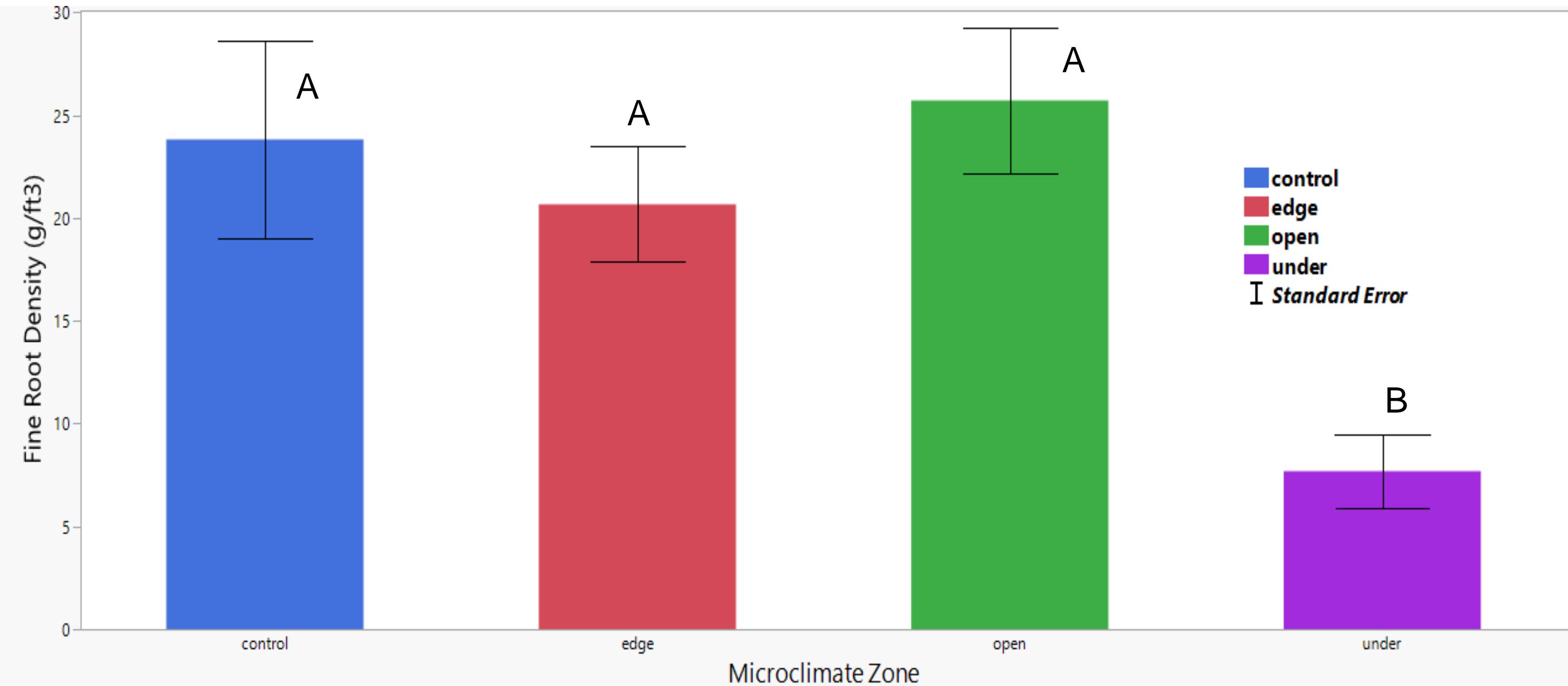
Effect of Vegetation Treatment on Hay Production



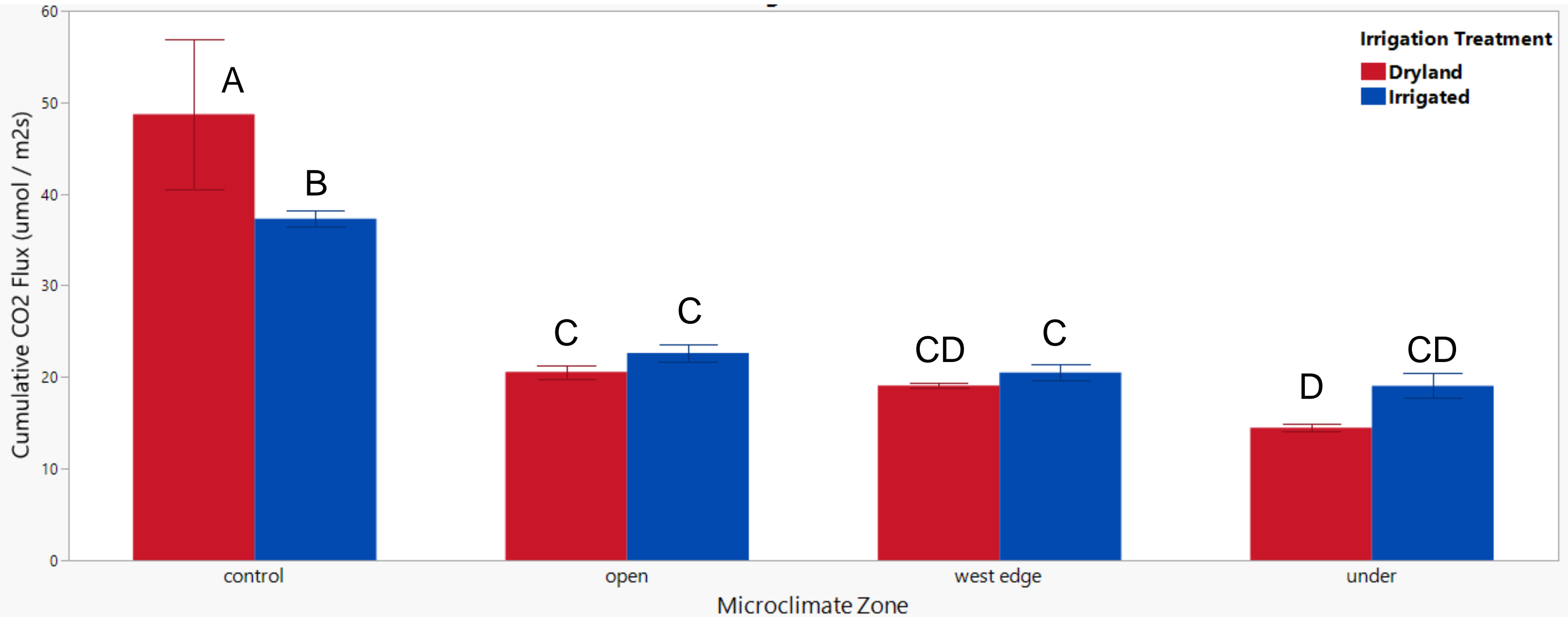
Effect of Microclimate Zone on Hay Production



Effect of Microclimate on Root Productivity

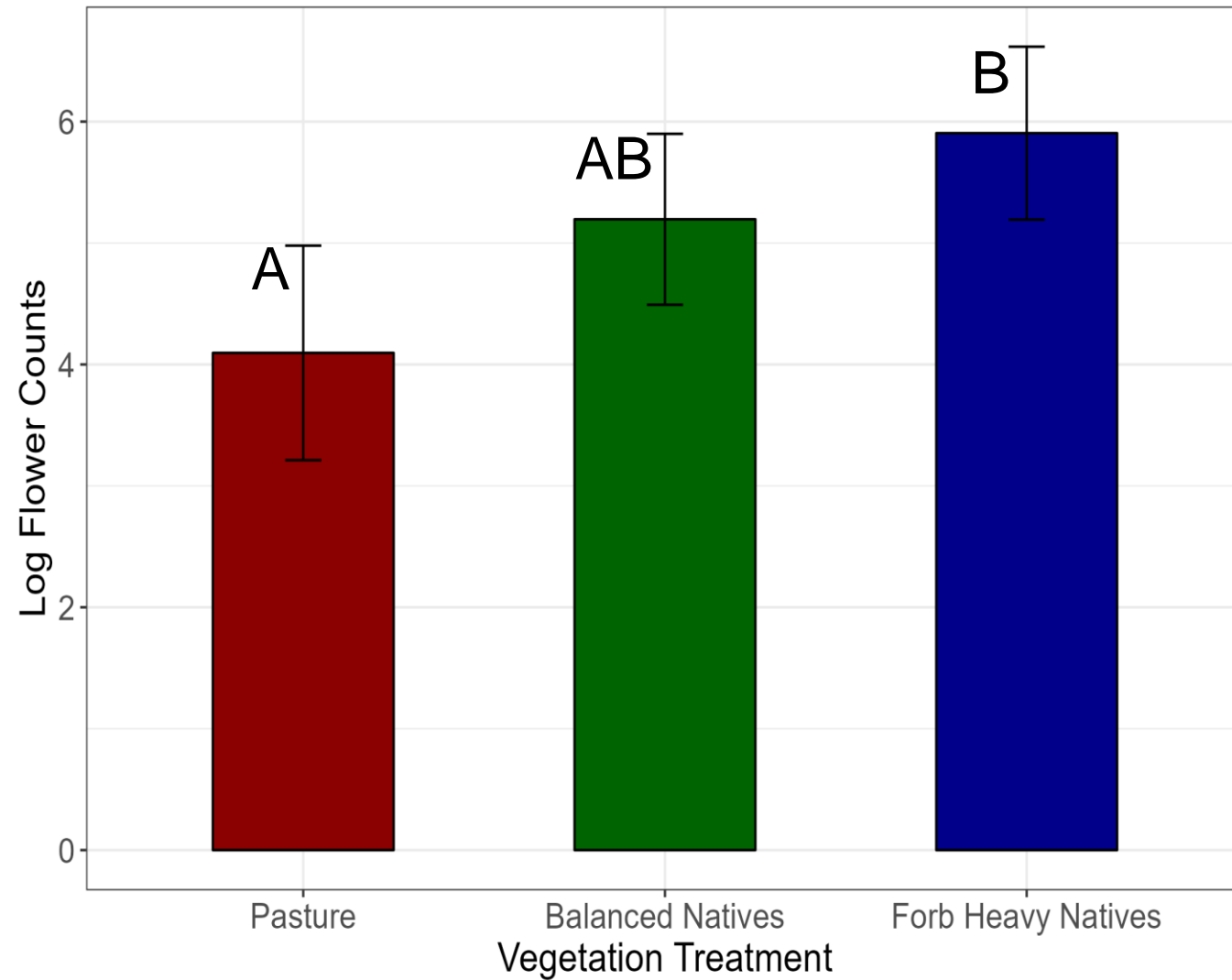


Effect of Microclimate Zone and Irrigation on Soil CO₂ Flux

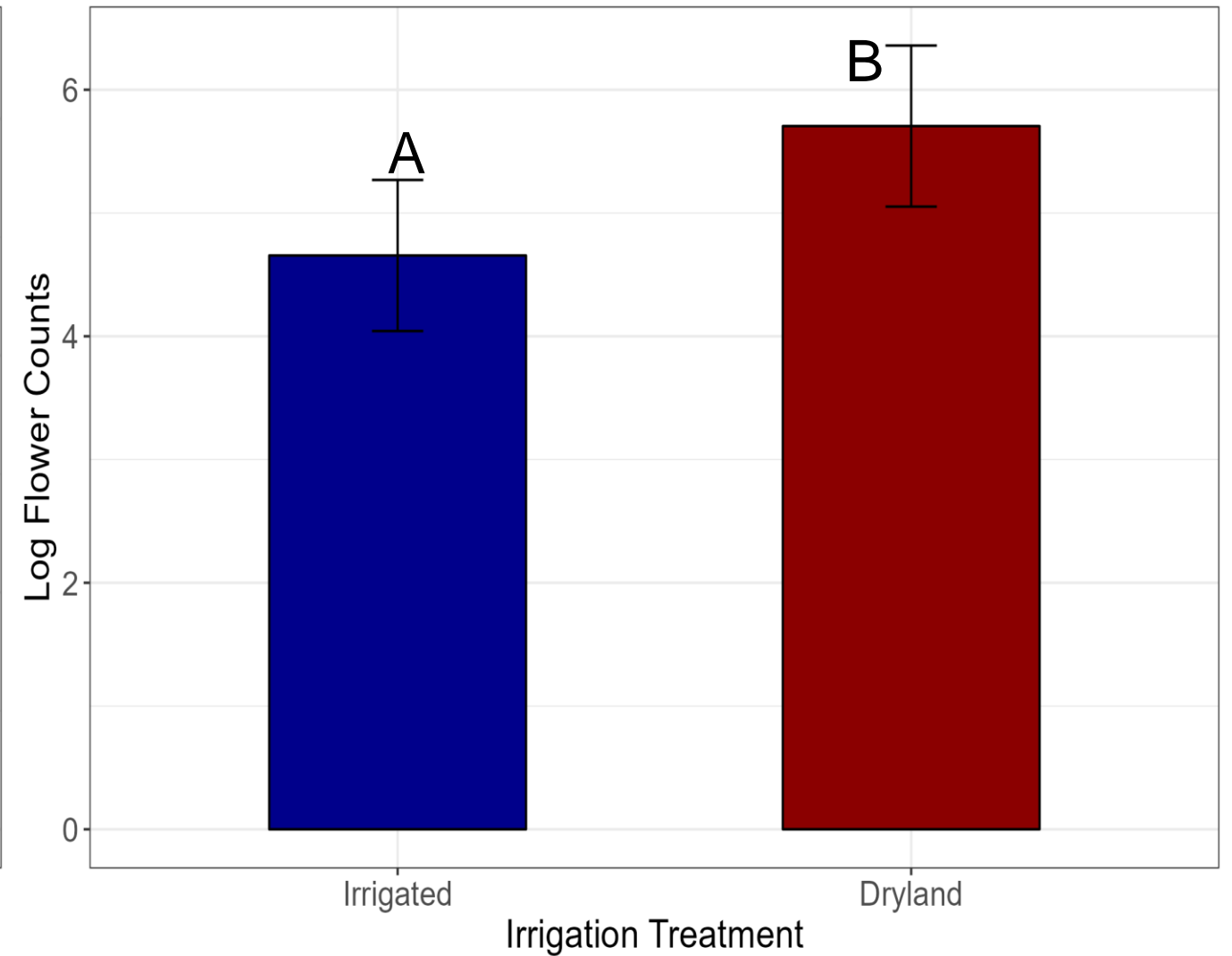


Each error bar is constructed using 1 standard error from the mean.

Effect of Vegetation Treatment on Floral Abundance



Effect of Irrigation Treatment on Floral Abundance



Thank you and Acknowledgements

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