

AGRICULTURAL CARBON CAPTURE IN NORTH DAKOTA RANGELANDS

Oil and Gas Research Program

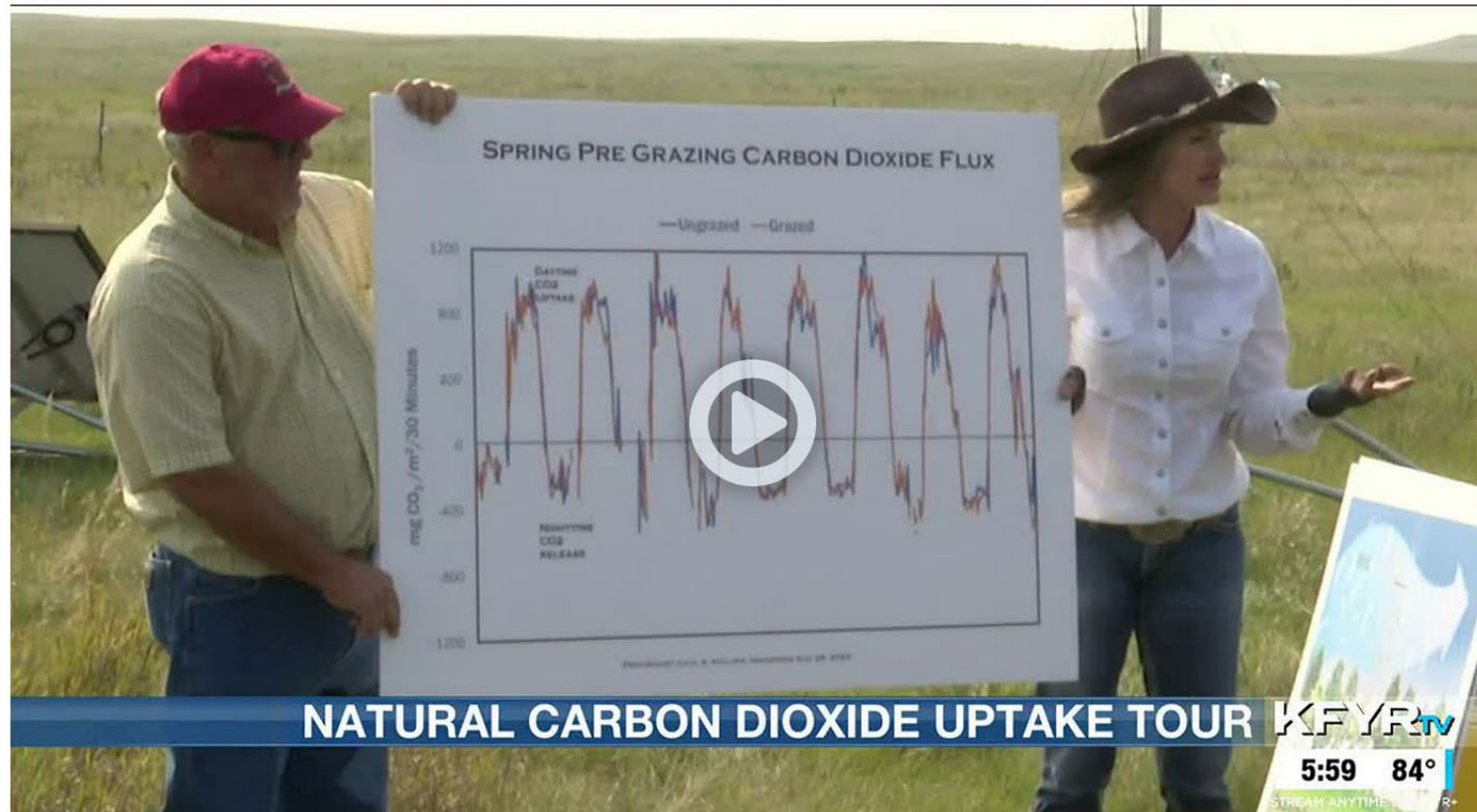
Bismarck, North Dakota, Dec 15, 2023

Jesse Beckers and Dr. Rebecca Phillips

North Dakota Natural Resources Trust, Ecological Insights



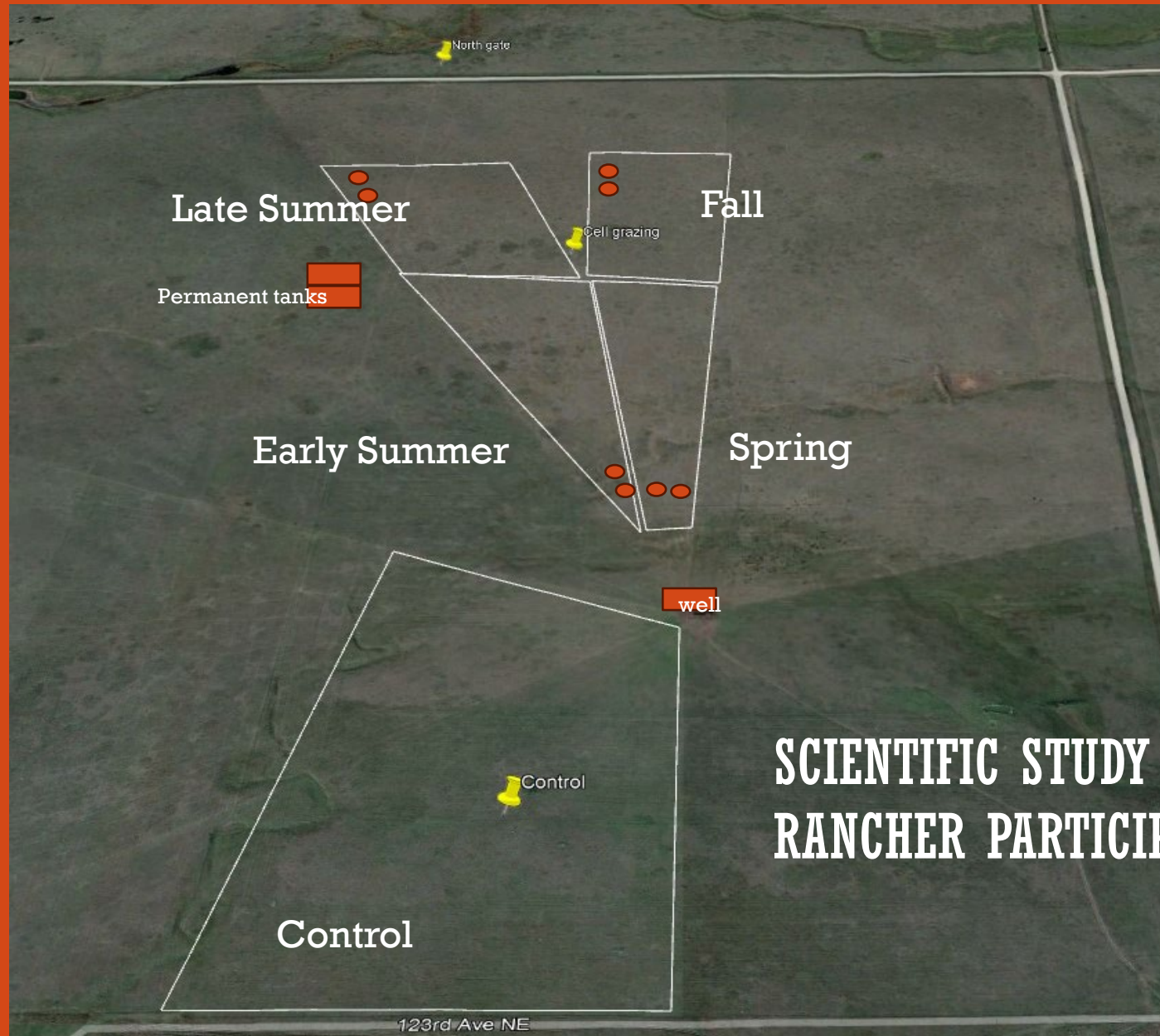
Natural carbon dioxide uptake grassland tour takes place in McKenzie



WE ARE MEASURING HOW GRAZING SYSTEMS ALTER CARBON CAPTURE IN REAL TIME



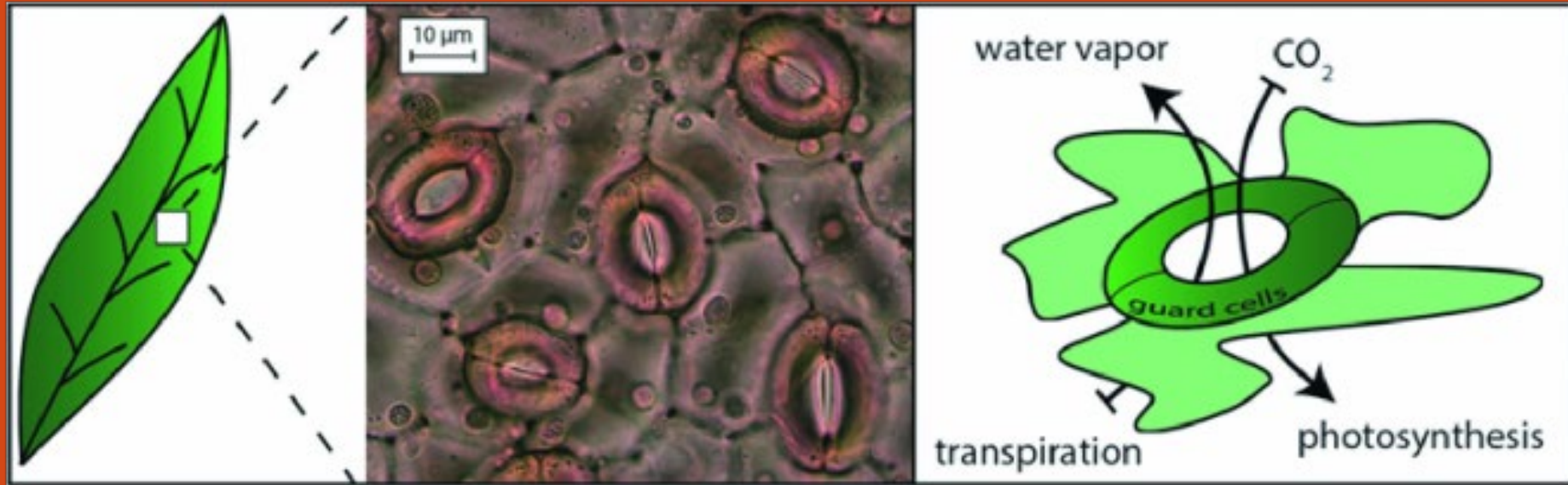
ON A WORKING RANCH WITH 150 COW-CALF PAIRS



USING STATE-OF-THE-ART TECHNOLOGY



TRACKS ECOSYSTEM “BREATHING” CONTINUOUSLY FOR 50 ACRE PASTURES

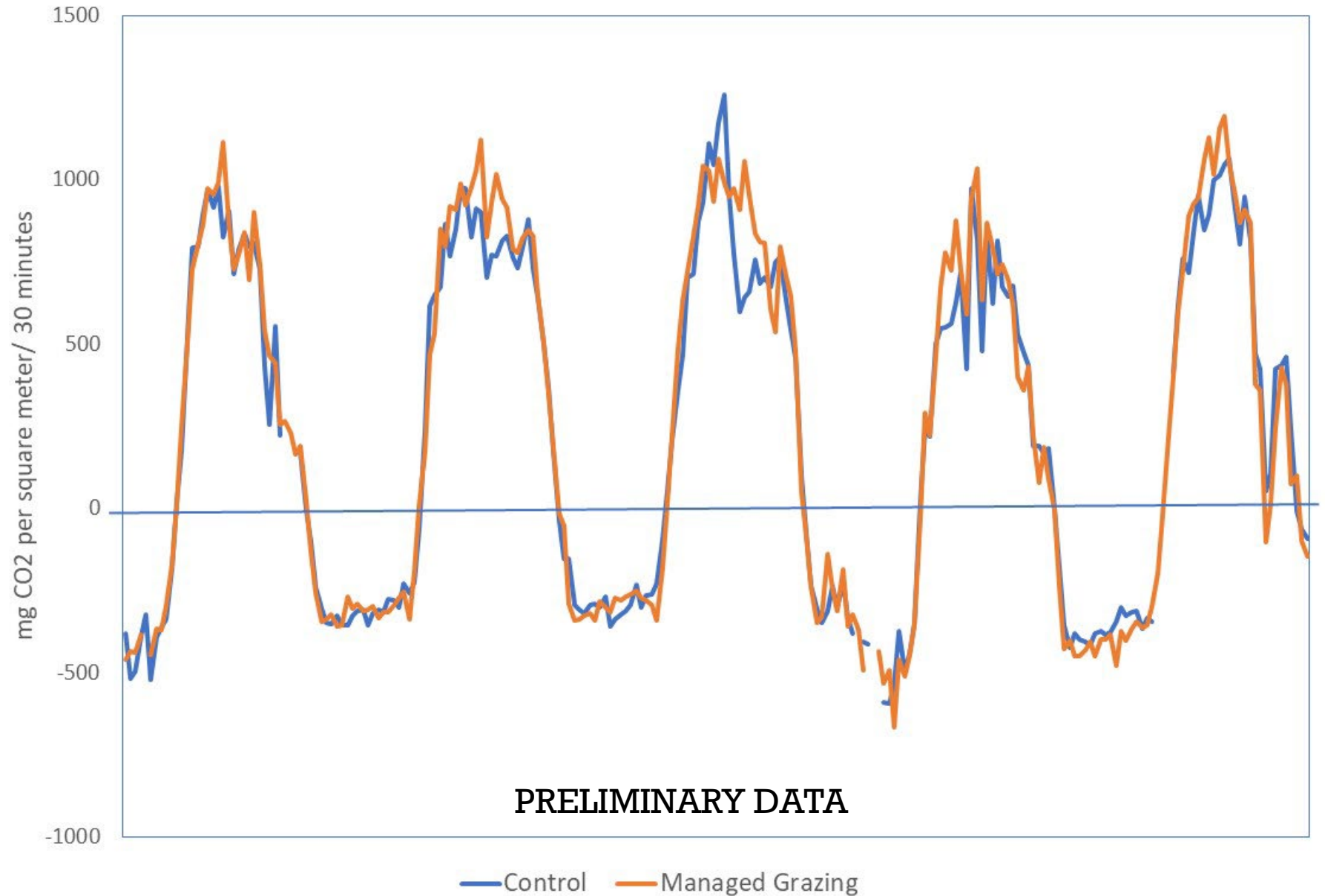


CO_2 moves in during the day and out at night



Net Ecosystem Exchange of CO₂

Prior to Grazing, May 24-28, Net Ecosystem Exchange of CO₂



CO₂ uptake daytime



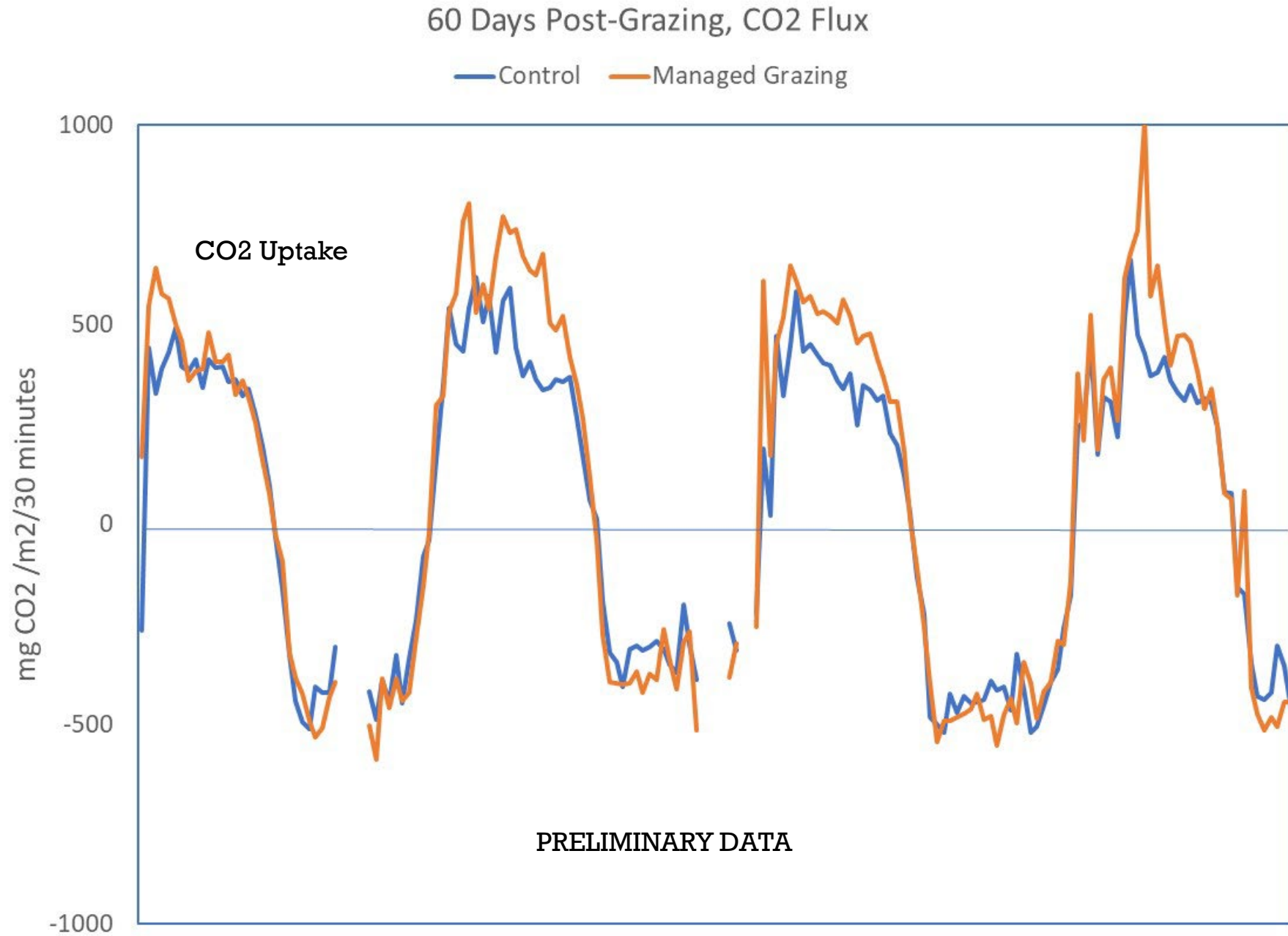
CO₂ release nighttime



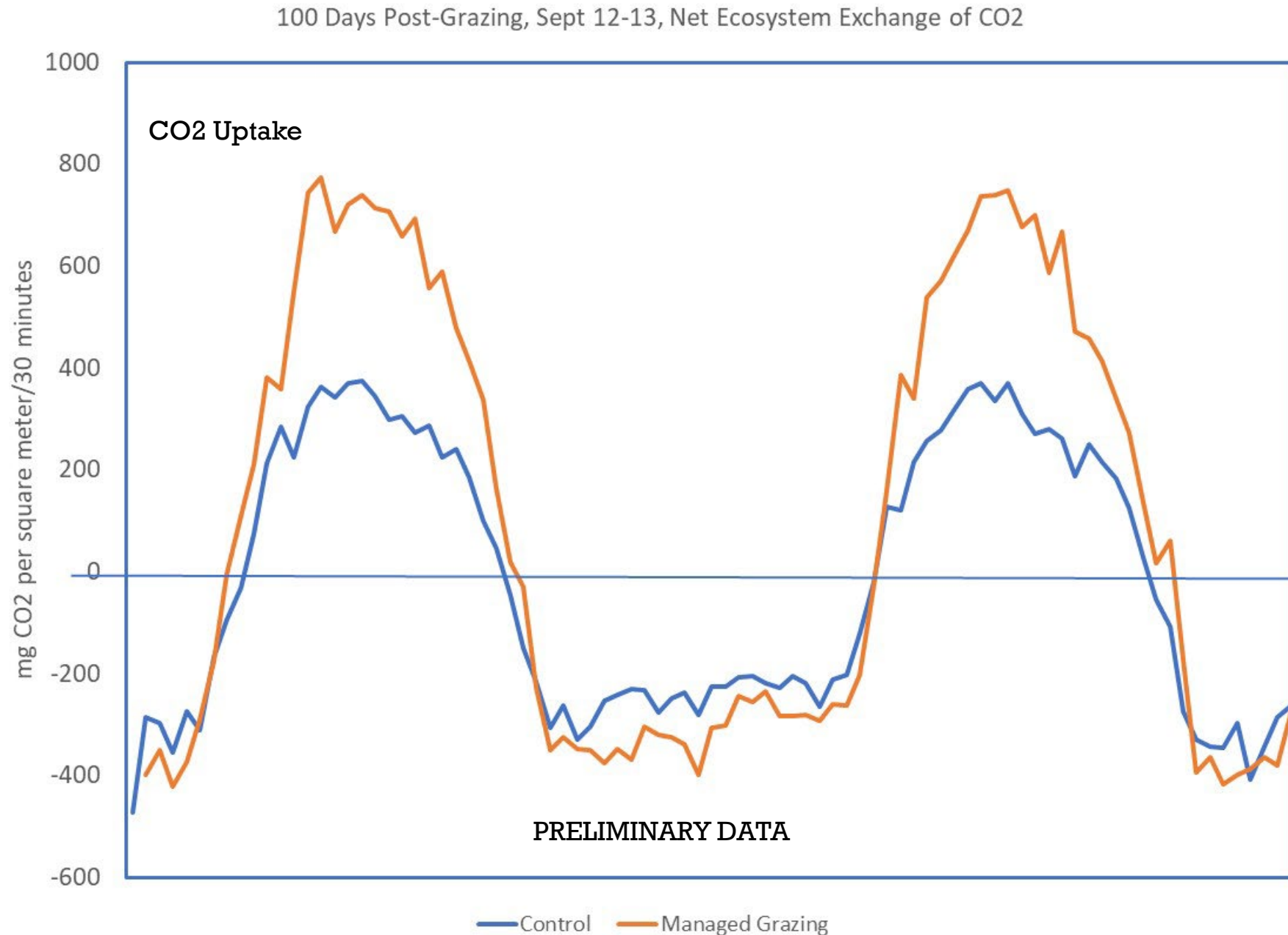
Graze each paddock until 50% of the leaf area is removed
Track forage recovery over time
Determine actual amount of forage and leaf area removed by grazers



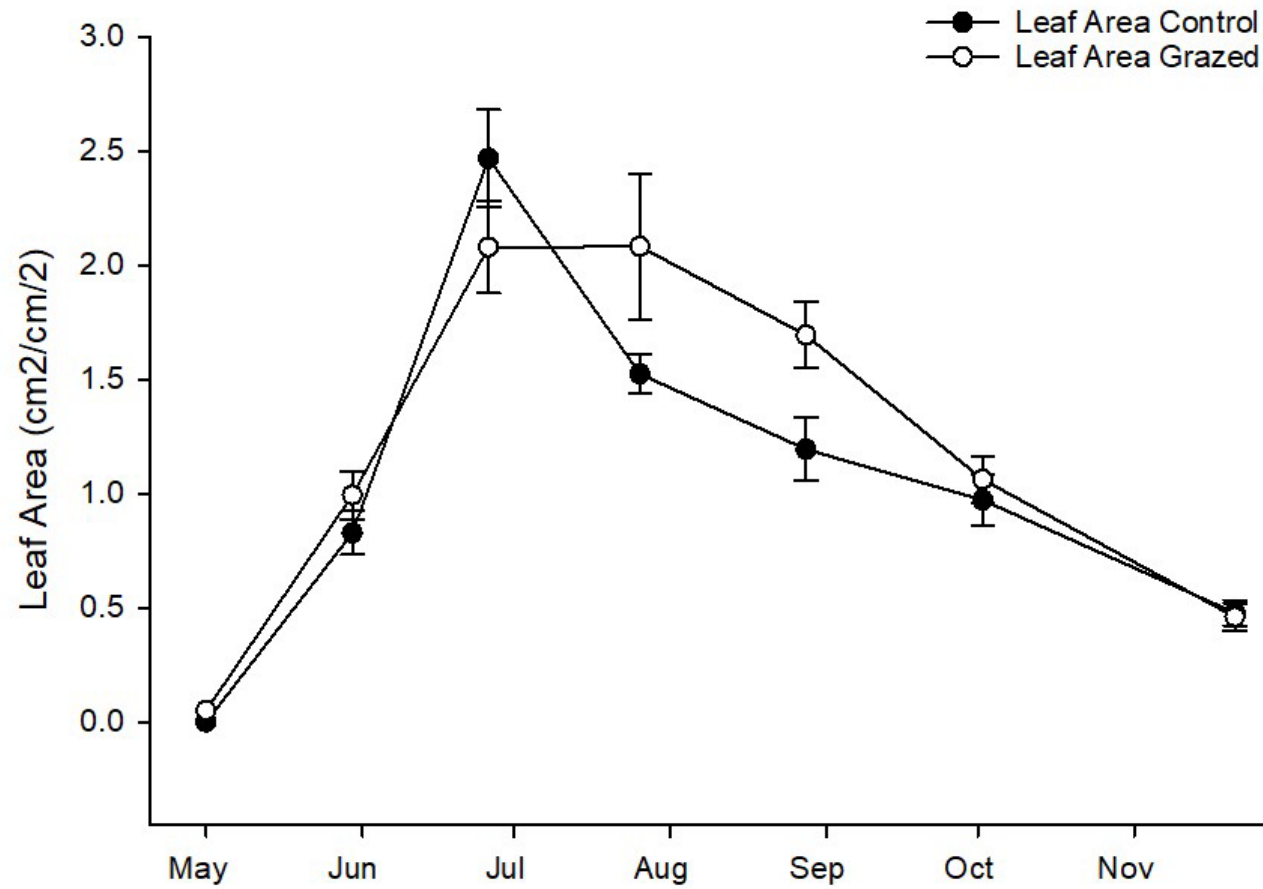
60 Days Post-Grazing Net Ecosystem Exchange of CO₂



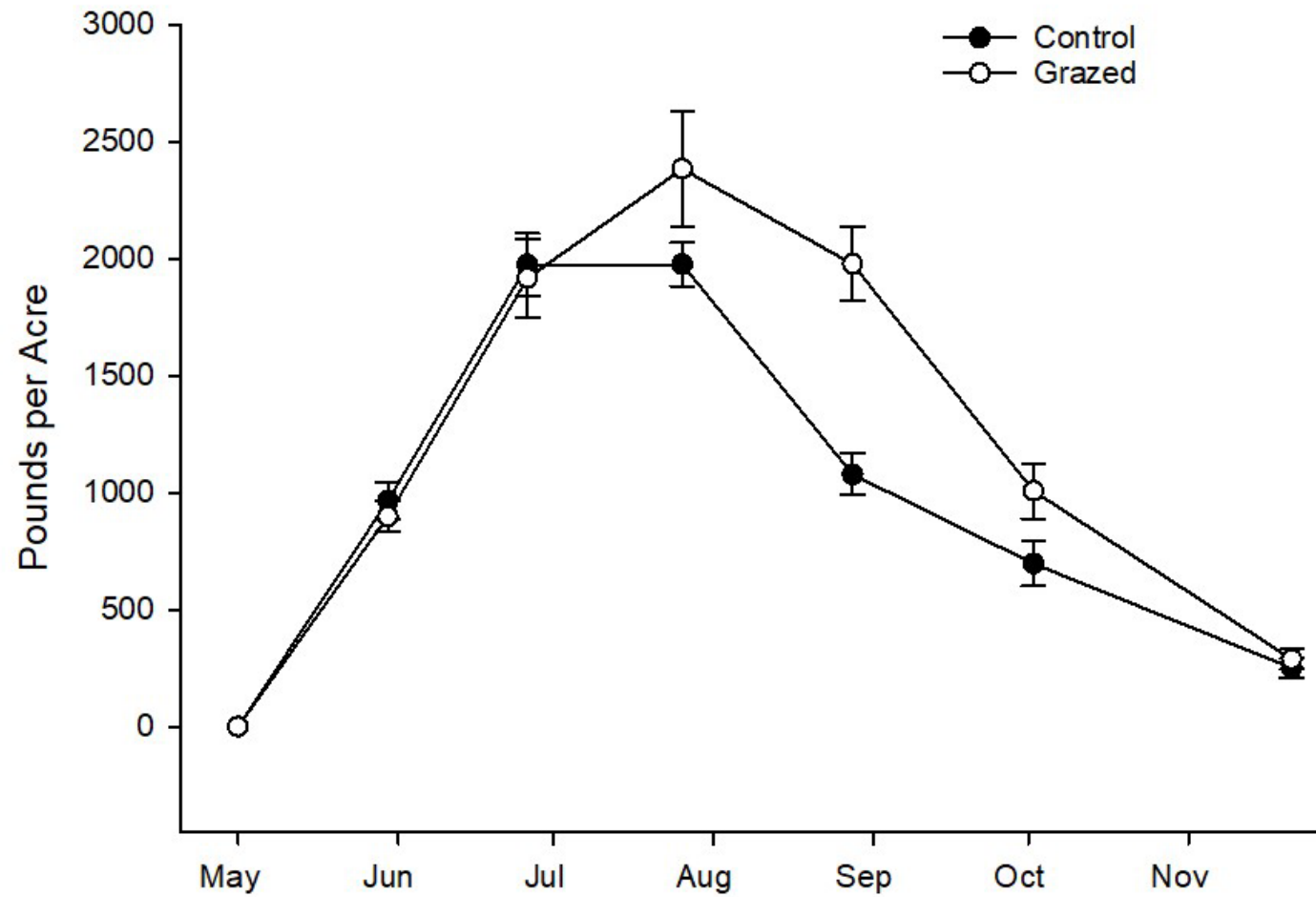
100 Days Post-Grazing Net Ecosystem Exchange of CO₂



Green Leaf Area 2023

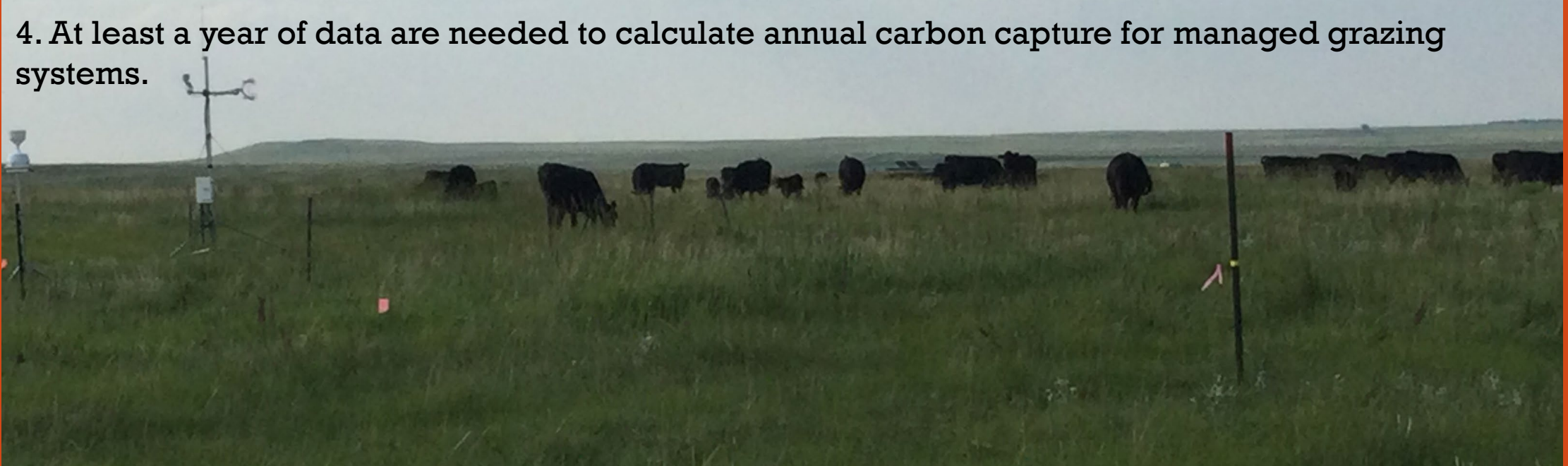


Dry Matter in Green Biomass 2023



Summary

1. We are testing if managed grazing influences carbon capture using working lands that are monitored every $\frac{1}{2}$ hour. Control and managed grazing pastures are located $\frac{1}{2}$ mile away from each other. Vegetation communities, soil series, and historical grazing management are similar.
2. Biomass, leaf area, and net CO₂ uptake were similar at the beginning of the season.
3. Biomass, leaf area, and net CO₂ uptake under managed grazing increased towards the end of the season.
4. At least a year of data are needed to calculate annual carbon capture for managed grazing systems.



SPONSORS AND PARTNERS

- Oil and Gas Research Program
- ND Petroleum Council
- National Fish and Wildlife Foundation
- ND Game and Fish Department
- Hess Oil (now Chevron)
- ND Grazing Lands Coalition
- ND Stockmen's Association
- Mercer County SCD
- Badlands Advisory Group
- Northern Great Plains Joint Venture



Rancher Lewis Heaton



