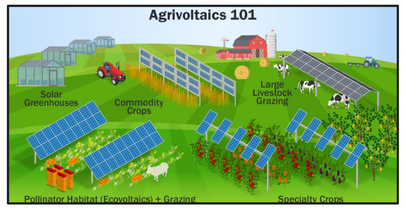
ADVANCING AGRIVOLTAICS RESEARCH AND EXTENSION IN COLORADO (LARIMER COUNTY)

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PROJECT INTRODUCTION

- Agrivoltaics is the dual use of land for both agricultural production and solar energy generation. In these systems, solar panels are designed and positioned to allow crops, livestock, or other agricultural activities to continue underneath or around the solar array. Agrivoltaic systems can provide renewable energy while maintaining agricultural production, creating opportunities to make agricultural land more multifunctional.
- Through my internship, I contributed to field research to better understand the applications and scientific basis of agrivoltaics, connected with producers implementing or considering agrivoltaics, and used these experiences to develop educational materials to further support producers and agrivoltaic development.



AGRIVOLTAIC FIELD RESEARCH

CSU Agrivoltaic Testing Grounds:
Located at CSU ARDEC South, the CSU Agrivoltaics Testing Grounds are a research and demonstration site developed through a partnership between Colorado State University and Sandbox Solar. The site includes multiple solar arrays with different panel designs, configurations, and transparency levels to study how solar systems interact with agricultural production in Colorado. This site investigates microclimates under panels, crop performance, shade and light transmission, dual land use strategies, and more!

Vertical Bifacial Solar Panels:
Panels capture sunlight from both the front and back of the panel. Their vertical design allows equipment to move easily between rows.
Current research: Barley
- Monitor barley growth stages and yield
- Monitor Daily Light Integral (DLI)
- Observe growing conditions between and adjacent to panels.

Initial observations show slightly delayed barley development immediately adjacent to the panels, probably due to shading

Varying Transparency Arrays
Nine agrivoltaic research arrays test three different levels of light transmission.
Current research: Alfalfa
- Collected wet and dry biomass
- Sampled different locations within each array
- Compared biomass under different transparency levels




ARDEC South- Fort Collins

PRODUCER CONNECTION/ SITE VISITS

Learning From Producers:
During my internship, I visited a variety of agrivoltaic operations and research sites across Colorado to see how systems are being designed and managed in different agricultural settings (see below). Through these site visits and conversations with producers and researchers, I learned about:
- Different approaches to agrivoltaic system design
- How systems are adapted to different crops
- Management considerations for agricultural production
- Questions producers have about agrivoltaics
- Information producers need when considering adoption

Seeing agrivoltaics in different agricultural settings helped connect the research I was doing at CSU with the real-world questions and needs of producers.



Jack's Solar Garden- Longmont



Chatfield Farms- Littleton



Western Colorado Research Center- Grand Junction



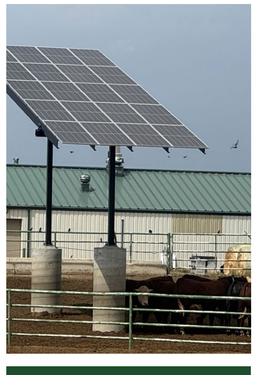
National Lab of the Rockies- Golden



Longroots Ranch- Longmont



Talbott Farms- Palisade



ARDEC Main- Fort Collins

EDUCATIONAL MATERIAL DEVELOPMENT

Agrivoltaics Produce Safety Survey:
There are currently limited resources and research specifically focused on produce safety in agrivoltaic systems. Because this is an emerging area, producers may have questions about how growing crops under solar panels could affect produce safety practices. As part of my internship, I developed a survey for agrivoltaic producers to identify their current practices, knowledge, concerns, and educational needs. The information gathered from the survey will help identify gaps and inform the development of a produce safety module for the CSU Extension agrivoltaics course.

CSU Noncredit Agrivoltaics Course:
One project during my internship was combining my research experiences and producer connections to help develop the outline for a CSU Extension noncredit course on agrivoltaics. The course is designed to help Colorado producers determine whether agrivoltaics is a good fit for their operation and provide practical guidance for getting started. The course addresses key producer needs, including real-world success stories, financial information, planning resources, and guidance for implementing agrivoltaic systems.

BIGGEST TAKEAWAY

One of the biggest things I learned through this internship was the importance of connecting research, producers, and Extension. Agrivoltaic systems are highly site-specific, and different crops, panel configurations, and environments create different growing conditions, so research does not always provide a simple answer that can be applied to every operation. Connecting with producers helped me understand the practical considerations, challenges, and questions that come with adopting agrivoltaics. This showed me that research is most valuable when it can be translated and adapted into information that producers can actually use. Extension serves as that connection between research and producers, helping turn research findings into practical resources, education, and tools that address real-world needs. This experience helped me see how important collaboration between these areas is for making agrivoltaic research useful and applicable in the real world.