



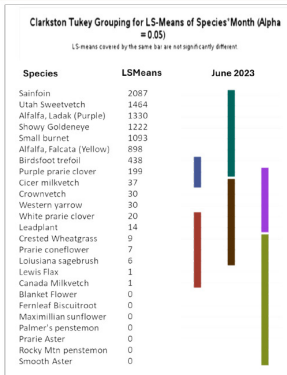
# Smart Foodscapes Annual Meeting

May 21st-23rd, 2024

# Photos







The best performing plants at this location, in the second year of establishment, are listed below:

Plant Species	Common Name	Binomial Nomenclature	Type	/m <sup>2</sup>
Alfalfa, Falcata	(yellow flower)	<i>Medicago sativa</i> L. ssp. <i>falcata</i> (L.) Arcang.	Legume	9
Alfalfa, Ladak	(purple flower)	<i>Medicago sativa</i> L.	Legume	13
Sainfoin		<i>Onobrychis vicifolia</i> Scop.	Legume	21
Showy Goldeneye	(native)	<i>Heliomeris multiflora</i> Nutt.	Forb	12
Small Burnet		<i>Sanguisorba minor</i> Scop.	Forb	11
Utah Sweetvetch	(native)	<i>Hedysarum boreale</i> Nutt.	Legume	15

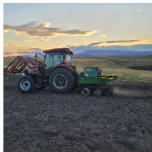
Showy goldeneye, small burnet and Utah sweetvetch all contain measurable hydrolysable tannins (small burnet contains a lot); sainfoin, small burnet, and Utah sweetvetch all contain condensed tannins. These have the potential to reduce methane and internal parasites.



We have a 55-acre pasture dominated by a "sea" of meadow bromegrass divided with electric fencing into six 9-acre paddocks.



- Three paddocks have just grass (Control) and each of the three remaining paddocks (Treatment) have three 40x30 m plots (islands) seeded (November 17, 2022) with strips (8x30 m each) of 1-Alfalfa-ALF, 2-Birdsfoot trefoil-BFT, 3-Sainfoin-SF, 4-Small burnet-SB, and 5- Forage kochia-FK.
- Only SF established and thus the other species were reseeded on May 26, 2023. Only SB and FK established in June, so ALF and BFT were reseeded September 6, 2023.

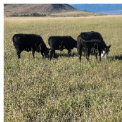
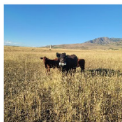


- Legume plots were sprayed for weeds (2,4DB; 700 cc/ha) and for grasshopper control (Sevin, 2 gallons of finished spray per acre) on July 3, 2023 and mowed July 15 for weed control.
- Plant counts in the island plots were carried out on August 1, 2023 and yielded: ALF:  $3.1 \pm 0.2$ ; BFT:  $2.0 \pm 0.2$ ; SF:  $295 \pm 2.5$ ; SB:  $113 \pm 2.5$ ; FK:  $20 \pm 1.1$  plants/m<sup>2</sup>.

- We collected baseline soil samples by identifying paired areas within each paddock (island and grass-3 plots; or just grass-3 plots) of similar size and on similar soil type. Within each area, we used 30-m transects to take 5 random samples using a Giddings probe with a 4-cm diameter core. Each core was sampled by depth at 0–10, 10–20, 20–40, 40–60, and 60–80 cm. Samples are being analyzed for soil organic carbon fractionation and soil health based on the Colorado STAR program.



- Despite legumes being under establishment, we tested the effects of some of the legume bioactives by adding these chemicals to a supplement in a grazing study. Twenty-four Black Angus cow-calf pairs were allotted to the six 9-acre paddocks (4 pairs/paddock). Animals in the Control (Ctrl) paddocks (n=3) grazed meadow brome grass supplemented at 8 am with 0.75 Kg of corn DDGS/cow/day. Animals in the Tannin Treatment (TT) paddocks (n=3) grazed under the same conditions but with the addition of an extract of DDGS (at 0.4% of the diet) that contained one-third hydrolyzable tannins and two-thirds of condensed tannins.



- Grazing occurred from July 14 to September 9, 2023.

- We determined cow (615±20 Kg-initial and 631±22 Kg-final) and calf (244±4 Kg-final) BW, spatial distribution (Lotek LiteTrack Iridium GPS collars), and activity (number of steps taken, motion index, lying and standing bouts using pedometers-IceQubes). Methane emissions (SF6 technique) were determined and fecal (N and fiber, fecal output) and urine (N and urinary output) samples were collected during 5 consecutive days/period. Blood (urea N, antioxidant/antiinflammatory function, total phenolics), and rumen fluid (microbiome) were collected during 1 day/period. Herbage dry matter (DM) availability per unit area in each paddock was assessed before and post-grazing during each period using a rising plate pasture meter (Control= 5,048±691-initial; 1,766±367-final Kg DM/ha; Treatment= 4,104±264-initial; 1,424±103-final Kg DM/ha).



USU Extension has been working with a group of livestock producers across the state of Utah to establish a series of "demonstration plots". We worked with producers to select locations that represented some of the varied range types throughout the state, while also selecting sites with the greatest potential benefit from the plots, such as those dominated by crested wheatgrass. We will continue to take measurements to determine how sites establish and persist under the typical grazing regime of that operation and speak with producers to understand what they perceive as the primary costs and benefits of this intervention are.



Location (nearest town)	Size of Plots (acres)	Number of Plots	Species Planted
Park Valley	2.5	1	Alfalfa, Sainfoin, Small Burnett, Cicer Milkvetch, Birdsfoot Trefoil, (limited irrigation on this plot)
Milville	0.4	1	Alfalfa, Sainfoin, Small Burnett, Cicer Milkvetch, Birdsfoot Trefoil
Coalville	0.8	1	Alfalfa, Sainfoin, Small Burnett
Nephi	0.9	2	Alfalfa, Sainfoin, Small Burnett, Cicer Milkvetch
Mt. Pleasant	1.0	1	Alfalfa, Sainfoin, Small Burnett, Cicer Milkvetch



Partner School, Edith Bowen Laboratory School (EBLS)

**Education Research Team:** Kathy Cabe Trundle, Rita Hagevik, Kaitlin Campbell, Katherine Vela, Aurora Villa, William Boone, Lawrence Krissek, Mesut Sackes, Amanda Dawson

**5 Partner Schools and Grade Levels:** 2 Elementary Schools (EBLS [K-6], Wellington Elementary [PK-5]), 2 Middle Schools (Pinnacle Canyon Academy [K-12], Wahlquist Junior High [7-9]), 1 High School (Carbon High [9-12])

**School Gardens:** One greenhouse (8' x 16'), One garden shed (7' x 7'), Two rain barrels (66-gallons each), Two compost bins (12 ft<sup>3</sup> each), Six raised garden beds (4' x 12'), One indoor and one outdoor weather station, One trail camera, One bioacoustic monitor, Ten native bee homes, Ten ibuttons for temperature, One drone, Six digital microscopes.

**17 Partner Teachers:** 3 Art, 6 Elementary, 5 Middle, and 3 High School teachers who review, pilot, and implement project lessons; recruit other teachers to participate in the garden project; help with dissemination; select and secure garden site; work with administrators and grounds at schools.

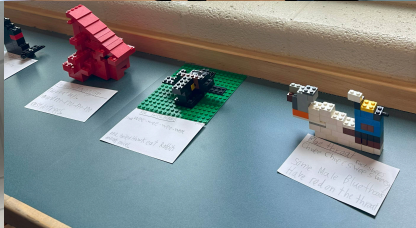
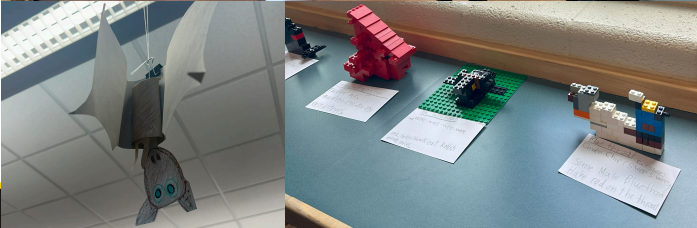
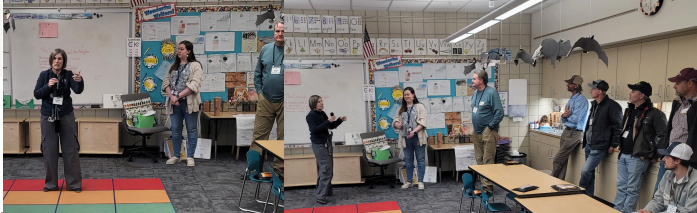
**Site Visit at EBLS:** EBLS is a K - 6 public charter school located on Utah State University Campus. A unit within the College of Education and Human Services (CEHS) was founded in 1928 as a teacher training site for CEHS. Edith Bowen was a principal and kindergarten teacher. EBLS focuses on place-based education, project-based learning, service learning, STEAM initiatives, and the use of technology tools and related software applications, and it is a Beverley Taylor Sorenson Arts Learning Program school.

**EBLS Dream Team Lead Teachers:** Leslie Larsen and Shannon Rhodes  
**EBLS Garden Manager:** Nancy Simonds

#### Site Visit Agenda:

- Stop 1: Convene EBLS foyer- Welcome, Introductions, Orientation
- Stop 2: Music Room with Jill DeVilbiss - Forbes, Legumes, and Grasses Grow
- Stop 3: Art Room with Lisa Saunderson- Nature Journaling
- Stop 4: Joey Kozlowski's 2nd Grade Room- Citizen Science Project on Birds and Student Presentations
- Stop 5: Leslie Larsen Kindergarten Room- Garden Project Display and Student Presentations
- Stop 6: Shannon Rhodes' 1st Grade Room- Garden Project Display and Student Presentations
- Stop 7: Nancy Simonds- Garden Tour with student docents

3:00- Walk to EBLS Collaboratory for Education Summary and Wrap-up



### Education Goals

Model smart foodscapes and study the importance of biodiversity to plant, soil, and animal health as well as to the environment and overall human health and welfare.

Design a curriculum to improve students' understanding of biodiversity (e.g., botanical attributes of grasses and legumes, and biological relationships between flowers, pollen, and pollinators), environmental impacts, and sustainable beef production systems.

### Education Timeline

Program Activities	Yr 1				Yr 2				Yr 3				Yr 4				Yr 5			
	F	W	Sp	Su	F	W	Sp	Su	F	W	Sp	Su	F	W	Sp	Su	F	W	Sp	Su
Plan, Install, Maintain Gardens	E																			
	M																			
	H																			
Curricula Development + Camp*	E	Dev			Pilot				Research											
	M				Dev				Pilot					Research						
	H					Dev				Pilot				Research						
Professional Development	E	Dev			Pilot				Research											
	M				Dev				Pilot					Research						
	H					Dev				Pilot				Research						
Citizen Science	E	Dev			Pilot				Research											
	M				Dev				Pilot					Research						
	H					Dev				Pilot				Research						
Outreach and Dissemination	E																			
	M																			
	H																			

### Education Outcomes

Integrated STEAM Lessons: 50 Elementary, 57 Middle School, 50 High School

STEM Career Videos: 4 completed, 6 in progress, 12 planned

Resource Sheets for School and Home Gardens: 20 in process

Summer Camps: 2 completed in 2023, 2 planned for 2024

Children's Books: 3 planned, publisher identified

Teacher Professional Development Module: 2 drafted, 13 in process

Research Instruments: 5 vetted, validated, and implemented

Articles Published: 5 practitioners published, 1 research in review

Book Chapter: 1 published, 1 proposal accepted

Conference Presentations: 19 research, 19 practitioner



# RANCHERS' VIEWS OF SMART FOODSCAPES

## SUMMARY OF RESULTS FROM A SURVEY AND INTERVIEWS

### Prepared By:

Dr. Jessica D. Schad and PhD Student Zubair Barkat  
Sociology Program, Utah State University



College of Humanities & Social Sciences  
Community & Natural Resources Institute  
Utah State University



### A Qualitative Study of Utah Ranchers' Perspectives on Smart Foodscapes

Based on survey insights, we conducted 14 in-depth interviews with Utah ranchers.

Topics included: Ranchers' views on the SFS project, decision-making and trust, sense of place, and demographic information.

Most interviews were conducted on Zoom, with some in person at respondents' ranches. Duration ranged from 45 to 90 minutes.