UTAH STATE UNIVERSITY EXTENSION

Interseeding Cover Crops in Corn

Hadfield, J.A., Jacob.hadfield@usu.edu **Taylor, K.,** Kalen.taylor@usu.edu

Extension
UtahStateUniversity

Background

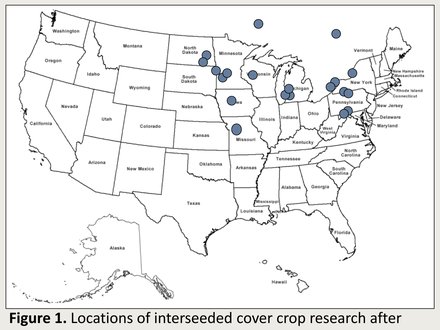

Figure 1. Locations of interseeded cover crop research after academic search.

Interseeding cover crops between the rows of growing corn has become of interest among Utah agriculture producers. However, little to no research has been conducted in the intermountain-west. This project aims to identify the most effective planting times of cover crops interseeded into corn in Utah

	Eastern States	Utah
Precipitation	30 - 50 inches 4 plus inches - May	16 - 20 inches 1.7 inches - May
Soil pH	4.5 – 6.0	7.5 – 8.2
Growing Season	170 - 190 frost free days	110 – 160 frost free days
Humidity	60 to 80 percent	35 to 55 percent
June Temperatures	78 to 85 degrees - High 60 to 67 degrees - Low	78 to 90 degrees- High 54 to 63 degrees - Low
July Temperatures	86 average high 70 average low	94 average high 68 average low
Water	Rain fed system	Sprinkler and flood irrigated

Figure 2. Climate differences from Eastern States vs. Utah

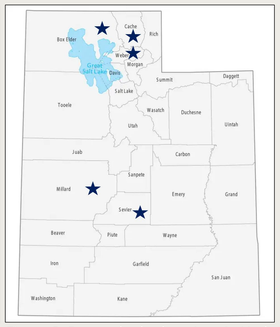

Figure 3. Research plot locations in Utah

Research Objectives

1. Quantify how cover crops interseeded with corn impact soil health
2. Determine how cover crop interseeding dates affect overall corn yield
3. Disseminate research results to Utah growers

Figure 5. Jang Seeder interseeding cover crops between corn rows (V4)

Weber						
120'	V10	V2	V6	V4	C	V8
90'	V8	V6	C	V2	V4	V10
60'	V6	V8	V2	C	V10	V4
30'	C	V4	V8	V10	V2	V6
	15'	30'	45'	60'	75'	90'

Figure 4. Example plot map from Weber County

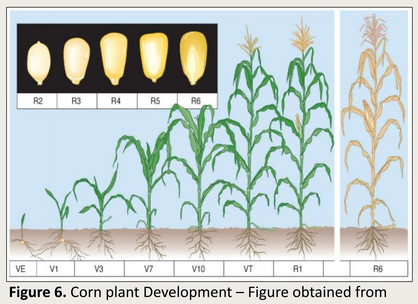

Figure 6. Corn plant Development – Figure obtained from Illinois Extension

Research Methods

- Utilized a 5-row Jang Seeder
- Interseeded at 5 corn growth stages (V2, V4, V6, V8, V10)
- Control of no cover crop was the 6th treatment

Figure 7. Jang Seeder (Interseeder)

Figure 8. Plot layout for Weber County

Kind	Variety	Type	Percent of Mix
Diakon radish	Buster	Brassica	12.42
Kale	Sub zero	Brassica	6.5
Turnip	Purple top	Brassica	3.5
Buchwheat	VNS	Broadleaf	6.98
Yellow mustard	VNS	Broadleaf	3
Intermediate ryegrass	Green spirit	Grass	18.41
Annual ryegrass	Tetrastar	Grass	6.91
Hairyvetch	VNS	Legume	22.4
Red clover	VNS	Legume	12.99
Brown flax	VNS		6.43
			99.54

Figure 9. Left – Chipper grinding three corn stalks randomly selected from each plot ; Middle – Samples ground to 1 mm for NIR analysis (NDF, ADF, TDN); Right –Cover crop seed mix utilized in plots.

- Research plots were 15' wide (6 corn rows) by 30' long
- Treatments replicated four times (random complete block design)
- 10' section of center two corn rows in each plot was harvested to determine corn silage yield
- Sub sample of 3 randomly selected corn stocks from each plot were chopped for forage quality analysis
- Corn quality samples analyzed at a certified lab

Results

Timing and Yield

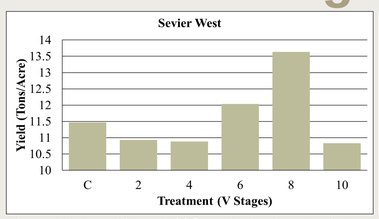

Figure 10. Corn Silage Yield from Sevier County plots (1 of 2).

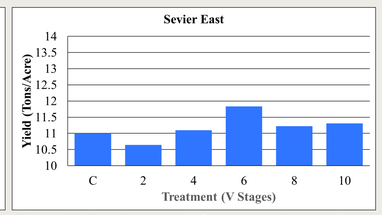

Figure 11. Corn Silage Yield from Sevier County plots (2 of 2).

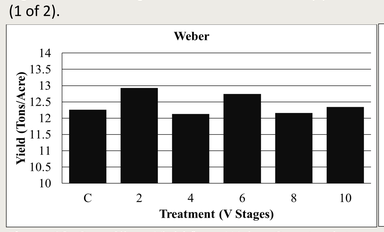

Figure 12. Corn Silage Yield from Weber County plots.

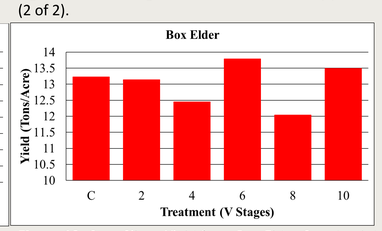

Figure 13. Corn Silage Yield from Box Elder County plots.

- Results found no effect ($p > 0.05$) of cover crop interseeding times on corn silage yield.

Issues/Concerns

Figure 14. Top – Box Elder County plot invested with weeds from lack of herbicide; Bottom – Same field pictured in top with herbicide application; Right – Furrowed Trench in Weber County

- Issues faced in 2021: Weed control, cultivation, and severe drought

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1.37	1.33	1.91	2.02	2.09	0.77	0.72	0.76	1.33	1.57	1.40	1.23
Total Precipitation (Avg.)						**16.5 inches**					

Average rainfall vs. 2021 rainfall in Cache County

Lack of rain and irrigation shortages led to problems throughout the state.

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
0.86	1.15	0.86	1.35	0.54	0.02	0.27	2.21	0.60	4.79	0.43	2.30
Total Precipitation						**15.38**					

Forage Analysis

- 2 Research Sites had nutritional differences ($p < 0.05$)
- TDN, NDF, & ADF

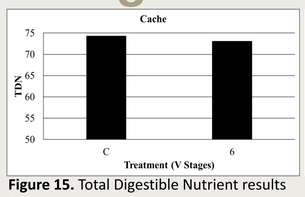

Figure 15. Total Digestible Nutrient results from corn plots in Cache County

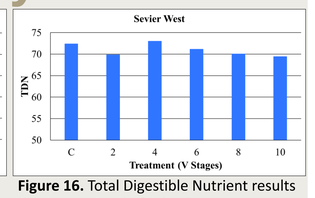

Figure 16. Total Digestible Nutrient results from corn plots in Sevier County

Conclusions

Figure 17. Left – Interseeded cover crop post corn harvest; Middle – Turnips in cover crop mix; Right – Interseeded cover crop post corn harvest

- V4 – V6 best interseeding time due to management practices
- No significant trends in cover crop interseeded corn silage nutritional quality
- Future work to utilize commercial interseeder, measure cover crop yield

Figure 18. Commercial interseeder (Cache)

Additional Collaborators: Pace, M., Zesiger, C., Gale, J., Palmer, M., Yost, M., Creech, E., Larsen, R

Utah State University is an affirmative action/equal opportunity institution and is committed to a learning and working environment free from discrimination, including harassment. For USU's non-discrimination notice, see equity.usu.edu/non-discrimination.