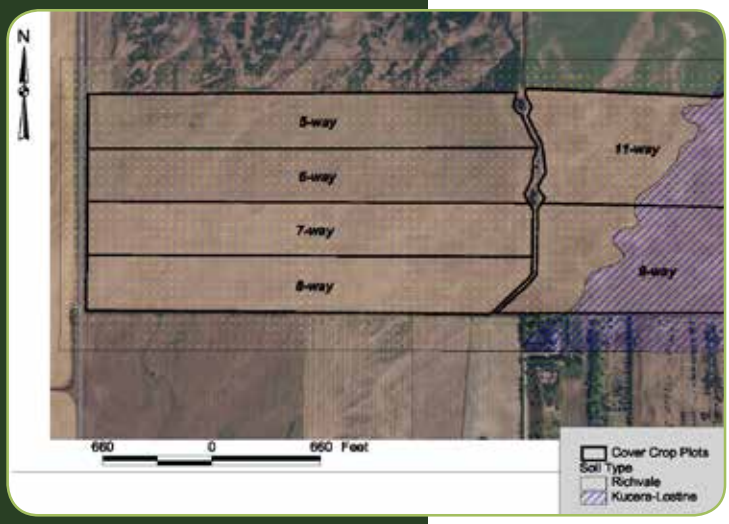
Piquet Land and Cattle:
Dryland Full Season Cover Crop for Forage



Piquet Land and Cattle, also called PK, is a 4th generation family owned and operated cow calf cattle operation. In the spring of 2018, Robert Piquet and his family transitioned 120 dryland acres from a barley-summer fallow rotation to a full season, multispecies cover crop mix for forage. Robert's main goals included determining what cover crop mixes would work well in a dryland system for beef cattle forage in Teton Valley, increasing plant diversity, and improving soil health.

To determine what cover crops would work well, Robert seeded six different full season cover crop mixes using the Teton Soil Conservation District's fifteen foot no-till seed drill. Overall germination and stand density across all cover crop mixes was good, producing an overall mean dry matter of 2.05 tons/acre, which is a high yield for a dryland annual crop in Teton Valley.

Seeding Notes

Field Preparation: Fall 2017, chisel plow 4 -6" deep and two passes with tandem disk

Seeding Method: Great Plains 15' no-till seed drill

Seeding Date: May 3 - May 5

Seeding Rate: Varies with mix (see table at right)

Cover Crop Seed Mixes: 6 different cover crop mixes were selected ranging from a 5-way species mix to an 11-way mix

Grazing Notes

Total Number of Acres Grazed: 80

Grazing Dates: July 21st- August 7th

Stocking Rate: 170 cow/calf pairs + 8 bulls grazed 4-5 acres per day

Frequency of Moves: Daily

Cow Days Per Acre (CDA): 37.8

Cover Crop Seed Mixes

	5-way	6-way	7-way	8-way	9-way	11-way
Variety						
Monida Oats	46%	44%	39%	38%	25%	25%
Tritical 141	45%	43%	38%	37%	24%	
Daikon Radish	2%	3%		3%		
Peredovik Sunflowers	4%	5%	5%	5%	5%	1%
Crimson Clover	3%	3%	3%	2%	3%	2%
Purple Top Turnip		2%	3%	2%	3%	2%
Common Vetch			10%	11%	12%	
Groundhog Radish			2%		2%	3%
Plantain				2%	2%	
Common Rye					24%	
Wooly Pod Vetch						2%
Austrian Peas						16%
Maple Peas						20%
Merlin Triticale						21%
Yamhill Wheat						5%
Pasja Turnip						2%
Seeding Rate	55 lbs/ acre	49.8 lbs/ acre	47.54 lbs/ acre	44.22 lbs/acre	43.28 lbs/ acre	56 lbs/ acre
Seed Cost (per acre)	**$29.04**	**$28.13**	**$30.33**	**$33.08**	**$30.29**	**$35.00**

While differences in crop productivity for each cover crop mix were not significantly different, Robert preferred the 5-way mix for forage. The more diverse cover crop mixes added plant diversity but not as much above ground biomass desirable for forage and building soil organic matter.

Grazing Methods

Robert used management-intensive grazing to achieve high stocking densities for a short duration of time followed by a long period of recovery. A total of 80 acres out of 120 acres were grazed, with 40 acres not grazed due to the cover crop stand becoming too mature. The cows were moved daily into 4-5 acre paddocks created with temporary electric fencing.

Cover crop productivity was measured using cow days per acre (CDA). Using this measurement, the 80 acres grazed produced 37.8 cow days per acre indicating that you could graze one cow on one acre for 37.8 days or 37.8 cows on 1 acre for 1 day.

Water Infiltration Rates

The average water infiltration rate was just over .50 inch per hour. This demonstrates that if it rains 1 inch in 1 hour, .59 inches will be absorbed into the soil and available for plants and the remaining .41 inches will run off. Water infiltration rates ranged from a minimum of .21 inches per hour (less than a quarter of an inch) to a maximum of 2.34 inches per hour.

	Water Infiltration Rates (inches/hour)
Minimum	0.21
Median	0.59
Maximum	2.34

Haney Test

The median soil health calculation, prior to cover crop application and the use of adaptive grazing, was 5.8 for the entire 120-acre parcel. If management practices are improving soil health, this soil health calculation should increase over time.

Field	Organic Matter % LOI	Soil Respiration (CO_2- C) ppm C	Organic C ppm C	Organic N ppm N	Organic C:N	Soil Health Calculation
Minimum	2.3	12.5	90	9.9	7.8	4.17
Median	2.45	21.25	116	12.8	9.05	5.84
Maximum	3.8	56.5	138	16.0	9.7	10.02

Key Lessons

- When growing a full season cover crop for forage, start with a simple cover crop mix with a few different species. Add species once gaining familiarity with cover crops.
- In this demonstration project, the more diverse cover crop mixes—8-way, 9-way, 11-way mixes—added plant diversity but not as much above ground biomass desirable for forage.
- For others growing a full season cover crop for forage, Robert would recommend a simple cover crop mix with a few different species for ease of seeding, quality of forage, and cost of seed mix.
- Next time, Robert would start grazing sooner to avoid not being able to use 40 acres of feed that was too mature to graze.