Evaluation of Alternative Cover Crops for Grazing Purposes

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December 21, 2018

Objectives

Determine forage yield and quality

Methodology

Plots were seeded at the WCFA Forage Research Site in Yellowhead County, AB on June 6, 2018 and at the WCFA Forage Research Site in Brazeau County, AB on June 8, 2018, with a small plot Fabro Disc drill in 5 rows at 22.5cm spacing (9m by 1.14m plot area). Soil testing was done and used to prescribe fertilizer applications. See Tables 1 and 2. We targeted the recommended seeding rate for each seed company. A pre-seed herbicide application was applied. One square meter from each variety was taken to determine yield and sub samples were collected to test for nutritional quality. These sub samples were sent to A & L Laboratories where quality analysis with wet chemistry was performed.

Treatments

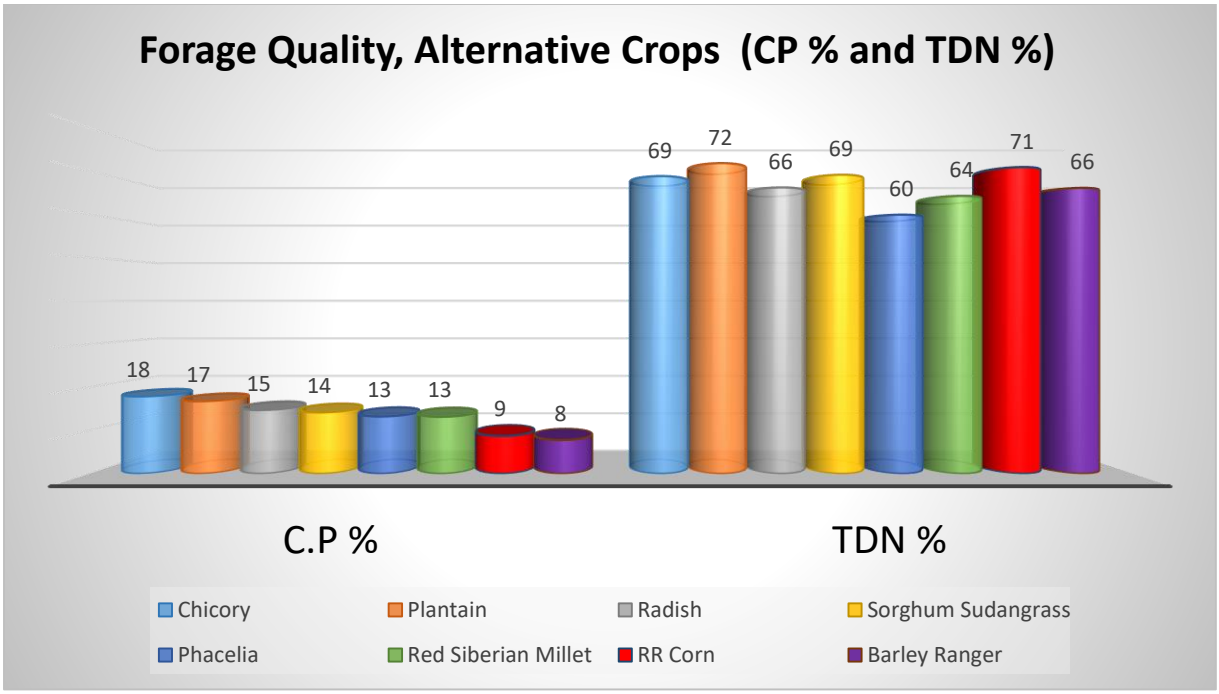
Forage annual crop	Scientific name	Seeding rate lbs/ac
Phacelia	Phacelia Tanacetifolia	7
Chicory	Cichorium Intybus	5
Radish	Raphanus Sativus	4.5
Plantain	Plantago Lanceolata	9
Red Siberian Millet	Siberian Millet	20
Sorghum Sudangrass	Sorghum × drummondii	13.5

Table 2. -2018 Alternative crops treatments and seeding rates, Brazeau and Yellowhead County, Alberta.

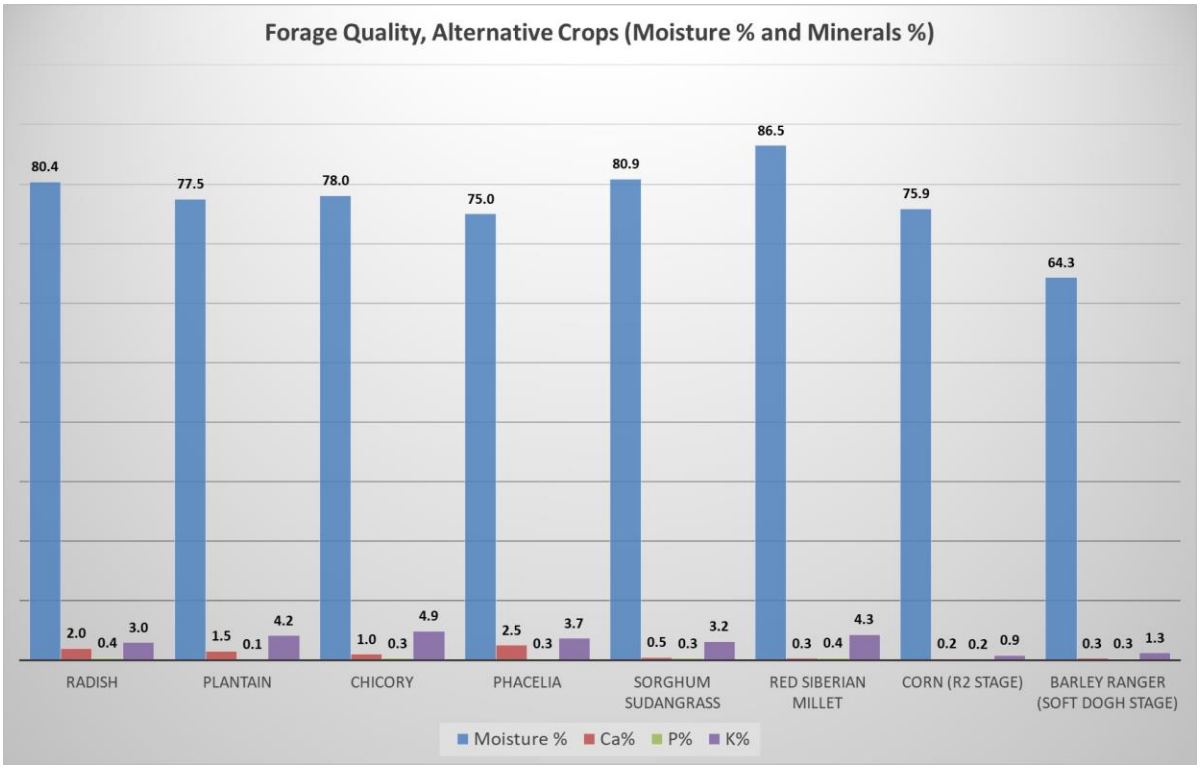
Discussion

Forage Quality

The quality values for treatments were analysed by Near Infrared Reflectance spectroscopy (NIR) analysis plus wet chemistry methods for minerals. The highest crude protein CP (%) was Chicory with 18% and the lowest was Red Siberian Millet with 13%. The highest Total Digestible Nutrients TDN (%) was from Plantain with 72 and the lowest was Phacelia with 60%. See Graph 1.



Graph 1. – 2018 Alternative crops treatments, Crude Protein (CP %), and Total Digestible Nutrients (TDN)
**RR Corn –for reference (red)*
**Barley Ranger –for reference (purple)*



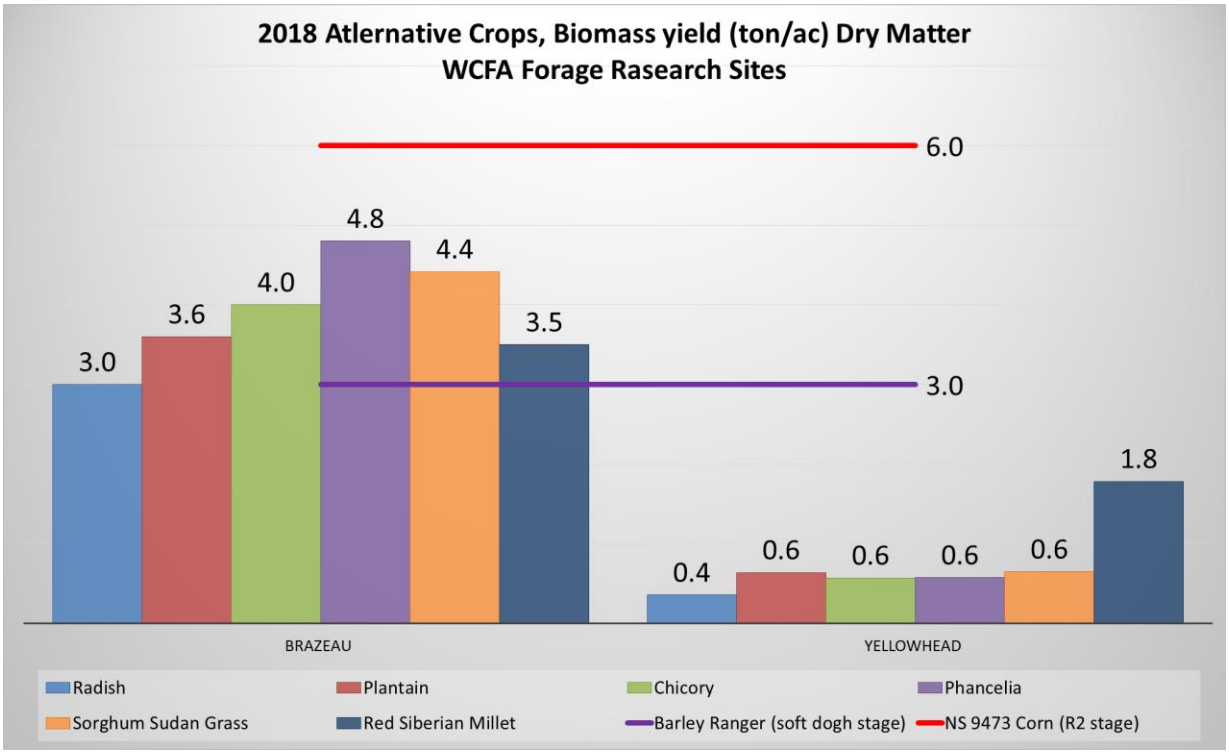
Graph 2. – 2018 Alternative crops treatments, Moisture % and Minerals %

Dry Matter Yield

Graph 3 shows two sites comparison of forage yield expressed in Dry matter (ton/acre, 1 ton = 2000 lbs).

Brazeau County site; the highest yield being Phancelia with 4.8 followed by Sorgum Sudangrass with 4.4 ton/ac. The lowest yield was Radish with 3 ton/ac.

Yellowhead County site; the highest yield being Red Siberian Millet with 1.8 followed by the rest of the varieties with 0.6 and the lowest yield was Radish with 0.4 ton/ac.

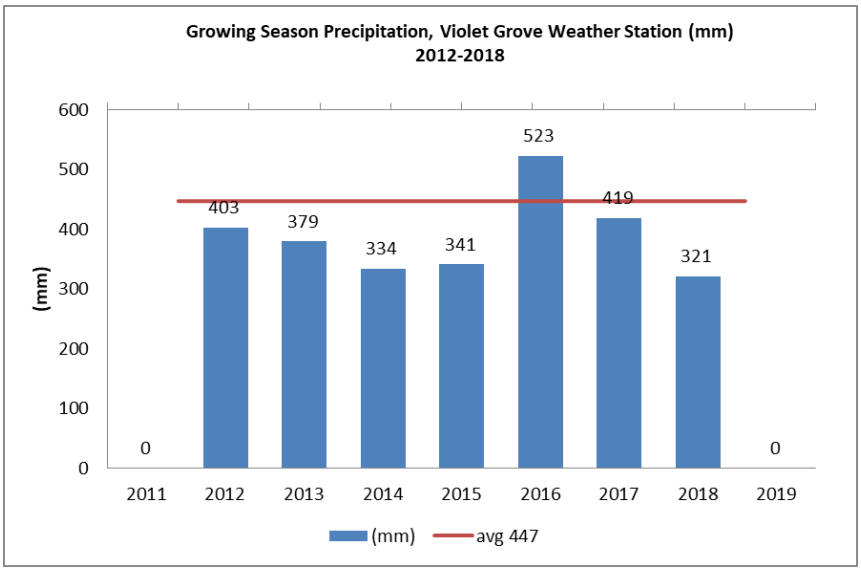


Graph 3. – 2018 Alternative crops treatments, DM yield. (Ton/acre, 1 ton=2000 lbs)
**Roundup Ready Northstart 9473 Corn –for reference (red)*
**Barley Ranger –for reference (purple)*

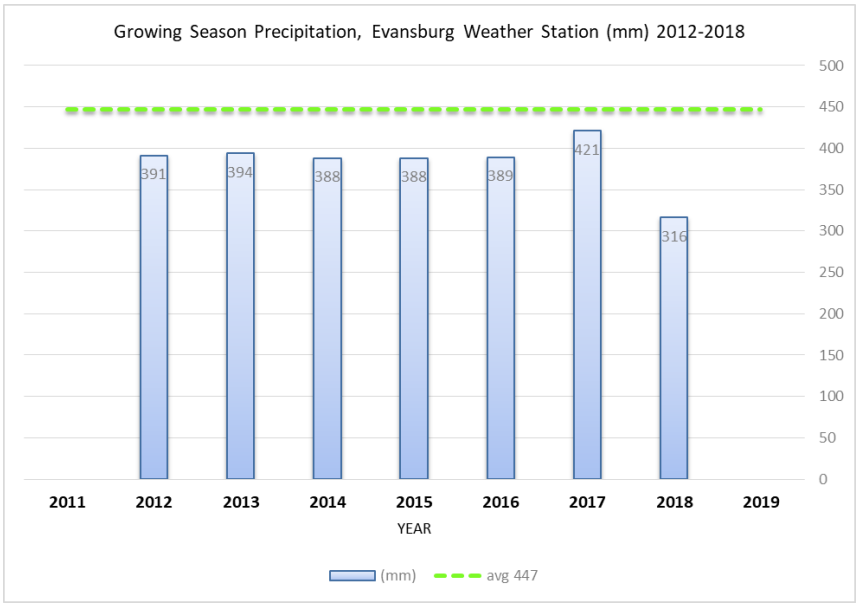
Environmental Conditions

Historical annual total precipitation of the gray wooded soil zone from 1971 to 2000 was 526mm (20.70 inches) on average. The growing season precipitation (May until October) is 447mm on average (Alberta Weather Data Viewer, 2016).

The total precipitation in Violet Grove was 321 mm (12.6 inches) and in Evansburg it was 316 mm (12.44 inches). However, this site received over 100 mm (3.9 inches) just over the month of July, which made the soil extremely wet and saturated during this period and therefore prevented all blends in the trial at this site (Yellowhead County) to emerge. This phenomenon is commonly known as drowned seeds. Graphic 4 and 5 shows the accumulative precipitation for the growing season for both weather stations.



Graphic 4. – Growing season precipitation for the Violet Grove weather station, 2012 to 2018 at Brazeau County



Graphic 5. – Growing season precipitation for Evansburg weather station from 2012 to 2018 in Yellowhead County

Picture 1. – Phacelia / 5.8 ton/ac dry matter. Brazeau County, August 2018

Picture 2. – Chicory/ 5 ton /ac dry matter. Brazeau County, August 2018

Picture 3. – Radish / 4 ton/ac dry matter. Brazeau County, August 2018

Picture 4. – Plantain/ 4.6 ton/ac dry matter. Brazeau County, August 2018

Picture 5. – Red Siberian Millet / 4.5 ton/ac dry matter. Brazeau County, August 2018

Picture 6. – Sorghum Sudangrass/ 4.4 ton/ac dry matter. Brazeau County, August 2018