Evaluation of cover crops yields using different seeding techniques

Fito Zamudio Baca, WCFA

Partners

- Union Forage
- Performance Seed- Lethbridge
- Northstar Seed Ltd
- Pickseed
- Yellowhead County

Background

Cover crops have traditionally been used to help hold the soil when transitioning between different types of cash crops, and are often plowed down before planting the next crop to add organic material and fertility to the soil. Farmers with livestock often select cover crops that can be grazed, adding an additional benefit as feed and the advantage of additional nutrients from animal manure *(Canadian Cattlemen June 13, 2016).*

Seeding is one of the most important aspects of cover crops and there has been a lot of work done on different seeding methods (i.e. drill, air seeding, sod, and no-till drill) however not so much on broadcasting seed with incorporation. This one-year trial demonstrated the yield of different blends and pure stands of cover crops when two seeding systems are used: Disc Drill and Broadcast.

Objective

Determine yield and quality differences on cover crops utilizing two different seeding systems (broadcasting and disc drilling)

Methodology

In 2017 plots were seeded at WCFA's Forage Research Site in Wildwood, AB on June 5 with a small plot Fabro disc drill in 5 rows at 22.5cm spacing (9m by 1.14m plot area), for the Broadcast plots the same Fabro disc drill was used but the hoses were removed and detached from seeder to allow seed to fall onto soil and incorporated with the packer wheels.

A soil test was done and used to prescribe fertilizer applications. We targeted the recommended seeding rate for each seed company (Table 1). A pre-seed herbicide application was applied. Samples were taken to determine yield and sub samples were collected for nutritional quality and sent to A & L Canada Laboratories for quality analysis with wet chemistry.

Treatments

The seed for the varieties used in this demonstration trial were donated by Union Forage, Pickseed, Northstar Seeds and Performance Seed.

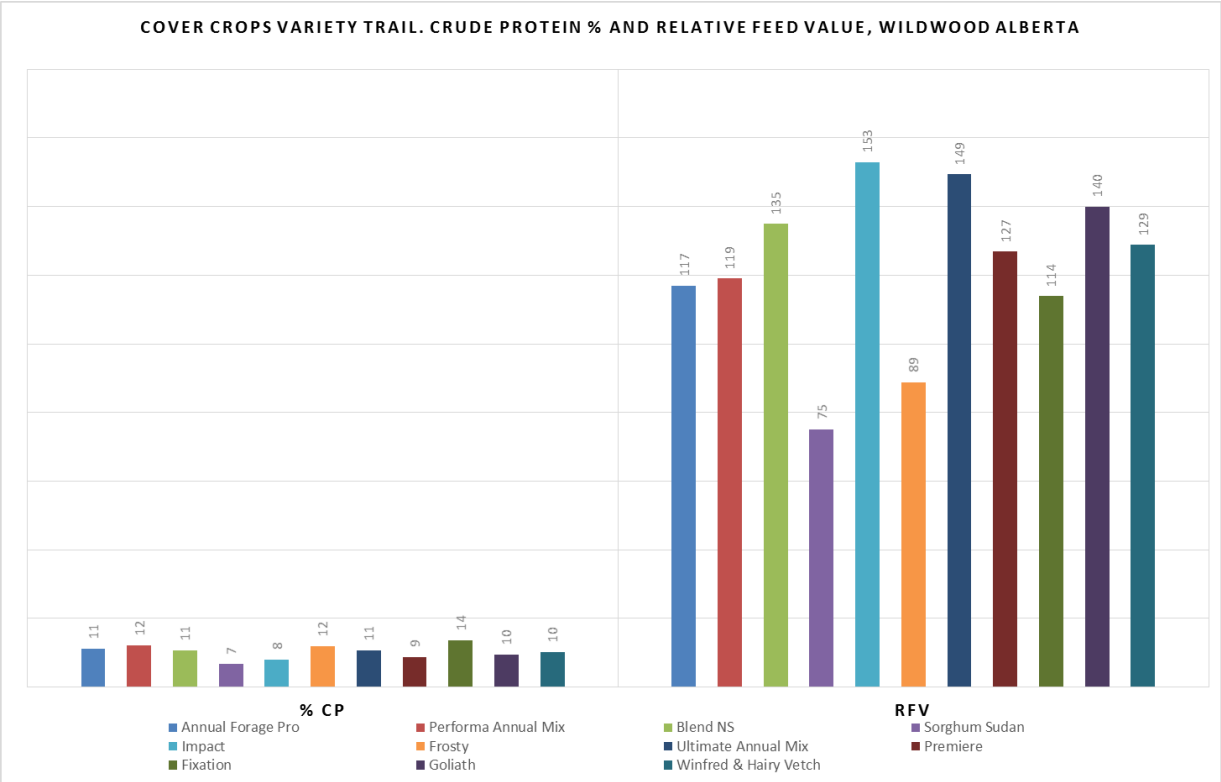
Treatment	Company	Variety	seed rate lbs/ac
Winfred & Hairy Vetch	Union Forage	Forage Brassica and Legume	3
Goliath	Union Forage	Forage Brassica	3
Ultimate Annual Mix	Union Forage	Green Spirit Italian Rye Grass 60% Hairy Vetch 18% Hunter Brassica 11% Winfred Brassica 11%	10
Annual Forage Pro	Pickseed	Forage Kale 5% Firkin Italian Ryegrass 20% Crimson Clover 12% Tillage Radish 13% Crown Millet 20 % Purple Top Forage Turnip 10% Hairy Vetch 20%	12
Sorghum Sudan	Northstar Seed Ltd.	Sorghum Sudan	10
Blend NS	Northstar Seed Ltd.	Nabucco Italian Rygrass 50 % Vivant Forage Brassica 14% Licapo Forage Rape 14% Fixation Balanse Clover 10% Appin Turnips 5% Frosty Beseem Clover 7%	12
Frosty	Performance Seed	Berseem Clover	6
Impact	Performance Seed	Forage Brassica	5
Fixation	Performance Seed	Balansa Clover	5
Premiere	Performance Seed	Forage Kale	4
Performa Annual Mixture	Performance Seed	Nabucco Italian Rye Grass 20 % Spring Green Festulolium 10% Premiere Forage Kale 5 % Impact Forage Brassica 20 % Frosty Berseem Clover 20 % Purple Bounty Hairy Vetch 10 % Fixation Balansa Clover15 %	8

Table 1. - Treatments and seeding rates Cover Crops Variety Trial 2017, Wildwood AB. For the broadcast treatments, the seeding rate was doubled.

Discussion

Forage Quality

Graph 1 shows the quality values for all treatments that were seeded in Wildwood in 2017. The highest crude protein CP (%) was Fixation with 14% and the lowest was Sorghum Sudan with 7%. The highest relative feed value RFV was Impact with 153 and the lowest was Sorghum Sudan with 75.

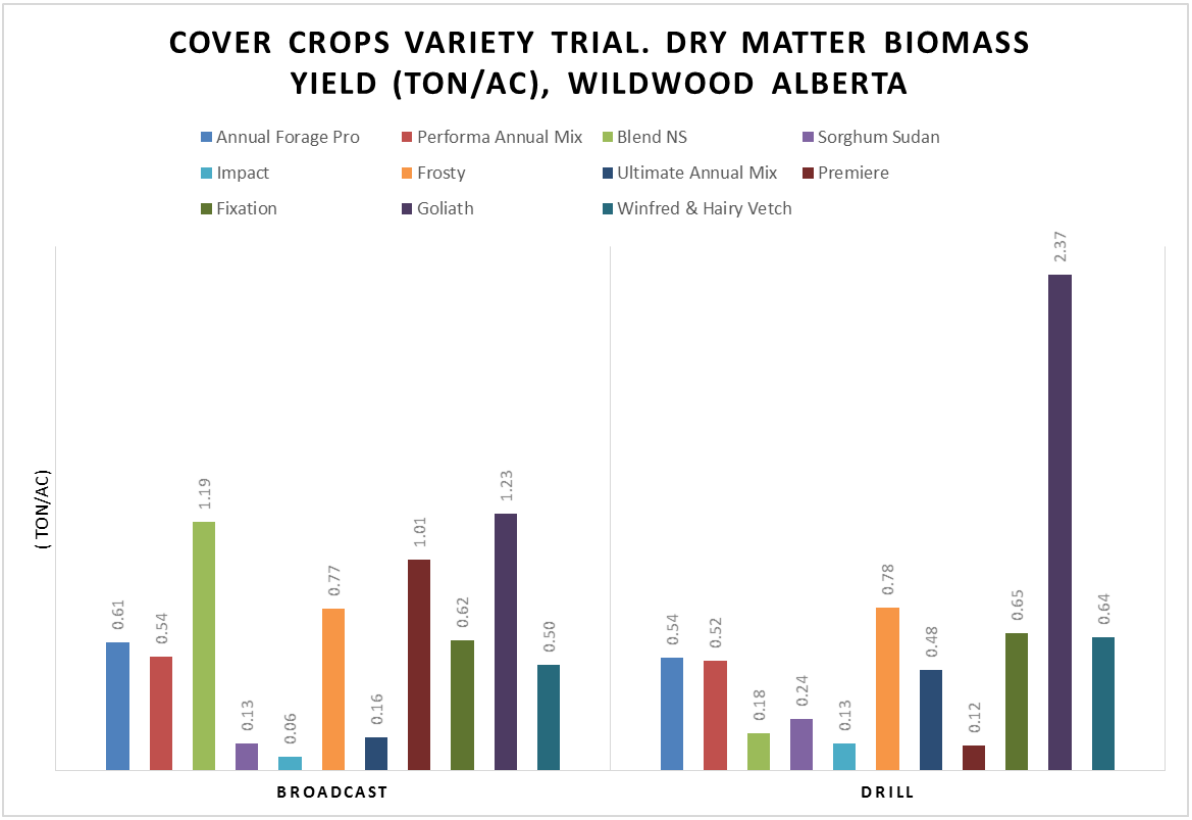


Graph 1. – Cover Crop Variety Trial, 2017 Relative Feed Value (RFV) and Crude Protein (CP %) Dry Matter basis. Wildwood AB.

Dry Matter Yield

Graph 2 shows the comparison of Dry matter (ton/acre; 1 ton = approximately 2204 pounds) for both seeding techniques (Broadcast and Drill). For Broadcast plots the highest being Goliath with 1.23 ton/ac and the lowest being Impact with 0.06 ton/ac. On plots that the Drill was used Goliath showed the highest with 2.37 ton/ac and Premiere the lowest with 0.12 ton/ac.

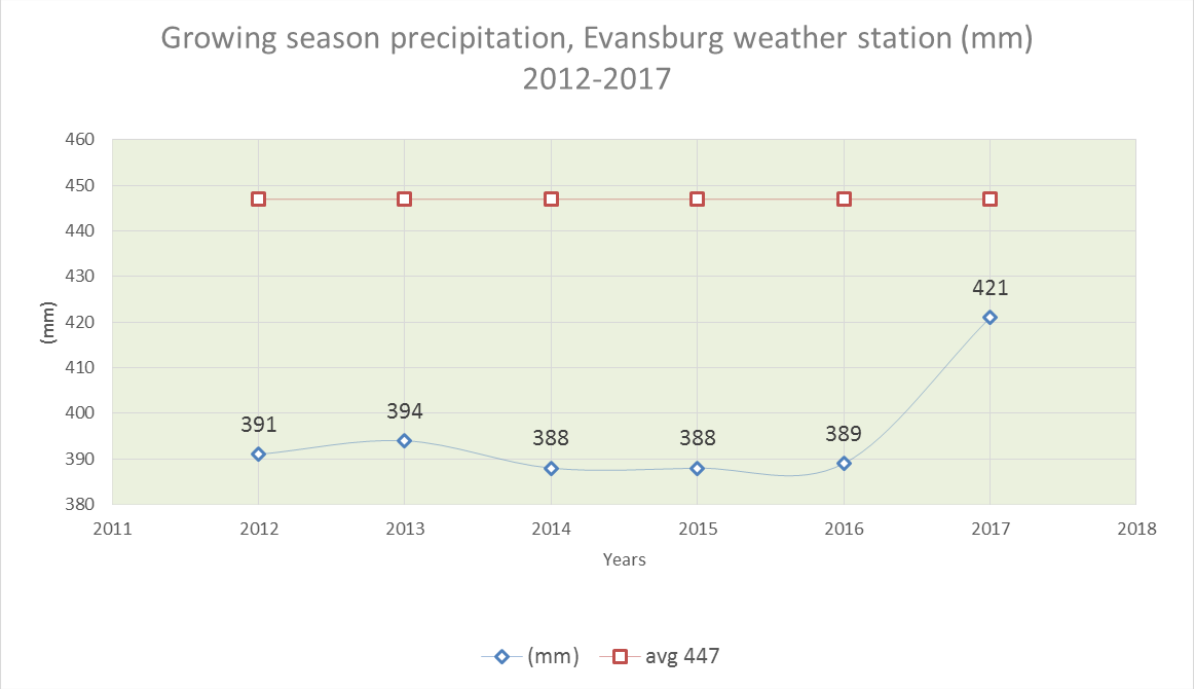
A related point to consider is that, in general both seeding techniques were not significantly different in terms of yield (ton/acre), with the exception of three drill treatments: Goliath with 1.14 ton/ac, Premiere with 0.89 ton/ac and Blend NS with 1.01 ton/ac compared to the respective broadcast treatments.



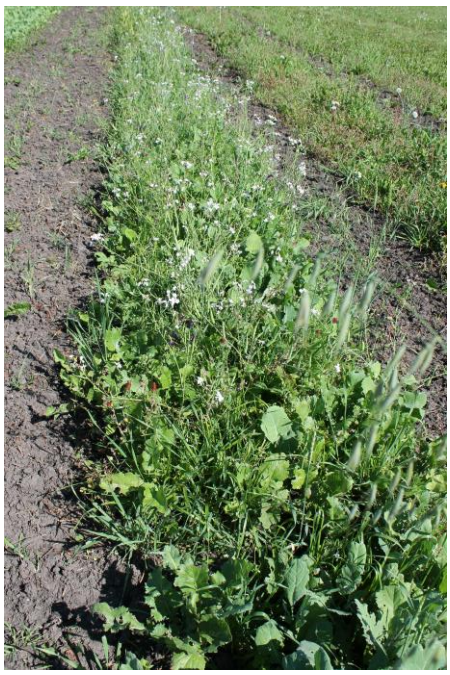
Graph 2. – Cover Crop Variety Trial 2017, DM yield (tone/acre, 1 ton = approximately 2204 pounds) from Wildwood, AB.

Environmental Conditions

Historical annual total precipitation of the gray wooded soil zone from 1971 to 2000 was 526mm on average and the growing season precipitation (May until October) is 447mm on average (Alberta Weather Data Viewer, 2016). Graphic 3 shows the accumulative precipitation for the growing season from the Evansburg, AB weather station.



Graphic 3. – Historic growing season precipitation for the Evansburg, AB weather station from 2012 to 2017



Picture 1. – Annual Forage Pro (Forage Kale, Firkin Italian Ryegrass, Crimson Clover, Tillage Radish, Crown Millet, Purple Trop Forage Turnip, Hairy Vetch) from Pickseed at Wildwood AB 2017

Picture 2. – Goliath (Forage Brassica) from Union Forage at Wildwood AB 2017

Picture 3. – Frosty (Berseem Clover) from Performance Seeds at Wildwood AB 2017

Picture 4. – Blend NS (Nabucco Italian Rygrass, Vivan Forage Brassica, Licapo Forgae Rape, Fixation Balanse Clover, Appin Turnips, Frosty Beseem Clover) from Northstar Seed Ltd. at Wildwood AB 2017