Demonstrations:

Cocktail Cover Crops for Livestock Feed

Partners: Union Forage
MD of Bonnyville

Objectives:

1. To assess growth and establishment of various cocktail cover crop mixtures.
2. To assess yield and quality of various cocktail cover crop mixtures.

Background:

Cocktail cover crops have been gaining in popularity in recent years, with the acres seeded in Alberta slowly increasing. These crops can be an important tool for producers to generate benefits on farm such as improved soil health, weed suppression, insect management and forage production for livestock feed.

Producers have many different options to choose from when it comes to cocktail cover crop species and each species has different abilities to provide depending on root and plant structure and physiology. Each operation is different and, depending on the desired results of the mixture, cocktail cover crops can be from 5 or 7 to over 15 different species or varieties.

Due to the high nutritional content of many species that are included in cocktail cover crop mixtures, such as brassicas and legumes, it is recommended to seed such species with a cereal crop such as oats or barley to balance out the ration. Recommendations are that brassica species should not comprise more than 50% of the cattle's feed intake.

Cocktail cover crops can be seeded at various times of the year depending on the required end use. Many brassica species will hold quality late into the fall and early winter, making them an ideal method to extend the grazing season. In these cases, later spring seeding is recommended.

Demonstration:

The demonstration was seeded as three blocks, side-by-side at the LARA Fort Kent Research Site (NE25-61-5-W4) in early June. Prior to seeding, soil tests were conducted and a blend fertilizer was side-banded at the time of seeding.

The species composition of each cocktail mixture is illustrated in table 1. Due to the high quality of many of the species included in the mixtures, it is recommended to seed with a cereal crop at least 50% of recommended rate Therefore, each mixture was seeded with CDC SO-1 oats. Seeding was done with a ConservaPak air drill with 12" row spacing and the demonstrations were seeded to a depth of 0.5 – 1".

Prior to harvesting of the demonstration, forage yield samples were taken, weighed and dried to determine dry matter (DM) yield. An additional sample was collected, frozen and sent to A & L Canada Laboratories for wet chemistry analysis.

Table 1. Cover crop cocktail mixtures species composition, 2016.

Cocktail Mixture 1 Union Forage Relay Mixture	Cocktail Mixture 2 Union Forage Ultimate Blend	Cocktail Mixture 3 Union Forage All Brassica Blend
60% Italian Rye Grass	30% Hairy Vetch	25% Winfred
20% Hairy Vetch	25% Italian Rye Grass	25% Goliath
10% Hunter	15% Sorghum	25% Hunter
10% Winfred	10% Crimson Clover	25% Graza
	10% Winfred	
	5% Hunter	
	5% Graza	

Results and Discussion:

The DM yield data results are summarized in table 2. The Union Forage Relay Mixture was the highest yielding treatment in the demonstration at 3.30 ton/acre. The All Brassica Blend was the lowest yielding, likely as a result of the increased moisture content due to the high percental of brassica species in the mixture (75% moisture at the time of sampling). The Relay Mixture and Ultimate Blend were at 69% and 73% moisture at the time of sampling.

Table 2. Cover crop cocktail mixtures yield data, 2016.

Cocktail Mixture	DM Yield (ton/acre
Union Forage Relay	3.30
Union Forage Ultimate	2.64
Union Forage Brassica	2.03

When considering quality, all three blends are adequate to meet the nutritional requirements of beef cows in late gestation and during lactation. The rules of thumb for gestating beef cows is 7% in mid-pregnancy, 9% in late pregnancy and 11% after calving (table 3).

Table 3. Cover crop cocktail mixture quality data, 2016.

Demo	CP	ADF	NDF	TDN	Ca	P	K	Mg
Union Forage Relay	12.97	29.19	46.47	66.16	0.49	0.22	2.12	0.33
Union Forage Ultimate	11.72	34.09	53.28	62.34	0.41	0.21	2.15	0.31
Union Forage Brassica	10.89	32.71	50.16	63.42	0.54	0.22	3.12	0.28

Total digestible nutrients (TDN) represent the digestible portion of the feed and is the easiest way to estimate energy content. Energy is the most important nutrient but is also commonly the most underfed in livestock rations in Alberta. If energy content is limiting, animals will no put any into growth and reproduction but will be utilizing all energy for maintenance (body functions, movement). The general rule of thumb is 55% in mid-pregnancy, 60% in late pregnancy and 65% after calving. The Relay Mixture is adequate to meeting the TDN requirements of gestating and lactating cattle. However, the other two blends have an estimated energy content to meet the requirements for gestating cows, but an energy supplement will need to be supplied after calving.

Neutral Detergent Fibre (NDF) and Acid Detergent Fibre (ADF) are a measure of the fibre content of the feed. It is recommended that NDF does not exceed 59% as increased values may restrict feed intake. The ADF levels in the mixtures are also within acceptable levels of 28-38 % for leguminous feeds.

Union Forage Relay Mixture (August 19, 2016)

Union Forage Ultimate Blend (August 19, 2016)

Union Forage All Brassica Blend (September 13, 2016)

Thank you to Union Forage for providing the seed for this demonstration.