

# Multispecies Cover Crop Cocktails in Northwestern Alberta: Agronomic Performance, Ecosystem Services & Economic Advantages (Cocktail Seeding Rates)



**Trial Site:** Fairview Research Farm  
**Funders:** Canadian Agriculture Partnership, MD of Fairview  
**Duration:** April 2019 – March 2021  
**Currently in Final Year**

In northern Alberta, the latest trend among beef cattle producers is growing a multispecies annual crop mixture for forage production. Growing multi-species annual crop mixtures (4 to 6 or greater number of species) or annual crops sequences/intercrops may often be considered as a practical application of ecological principles based on biodiversity, plant interactions and other natural regulation mechanisms as well as improved soil carbon stocks. Such mixtures could increase forage production, improve water and soil quality, increase nutrient cycling, moisture conservation, and crop productivity. Cover crop species for cocktails can be selected from a diversity of plant categories, such as cereals/grasses, brassicas, legumes, and forbs/herbs, which correspond to different plant functional groups and traits (e.g., biological N-fixation, deep root system for nitrogen scavengers). Each crop species in a mixture may reach maturity at slightly different times, therefore providing available immature forage continuously through the growing season.

## Cover Crop Cocktail Mixtures Under Investigation

**Control:** CDC Haymaker Oats (Monocrop)

**Control:** CDC Maverick Barley (Monocrop)

**2-Way Mixture:** Haymaker Oats & Horizon Peas

**3-Way Mixture:** Haymaker Oats, Horizon Peas & Winifred Forage Brassica

**4-Way Mixture:** Haymaker Oats, Hoizon Peas, Winifred Forage Brassica & Phacelia

**5-Way Mixture:** Haymaker Oats, Horizon Peas, Winifred Forage Brassica, Phacelia & Maverick Barley

**6-Way Mixture:** Haymaker Oats, Hairy Vetch, Winifred Forage Brassica, Phacelia, Maverick Barley & Frosty Clover

**7-Way Mixture:** Haymaker Oats, Horizon Peas, Winifred Forage Brassica, Phacelia, Proso Millet, Hairy Vetch & Vivant Forage Brassica

**8-Way Mixture:** Haymaker Oats, Horizon Peas, Winifred Forage Brassica, Phacelia, Italian Ryegrass, Crimson Clover, Vivant Forage Brassica & Chicory

## Seeding Rates

1. Cover crop treatments listed above
2. Seeding rates (3): The cover crop treatments are seeded at:
  - a) Recommended monoculture seeding rate
  - b) 125% monoculture seeding rate
  - c) 150% monoculture seeding rate

A substitutive approach (i.e., proportional replacement design) was used, such that seeding rates for each species in the mixture was proportional to their recommended monoculture seeding rate. The seeding rates for individual species in the mixture was then determined by dividing each recommended seeding rate by the total number of species in the mixture (e.g., divide by 4 for the 4 species mix).

## Forage DM Yield

The forage DM yield varied from 4,620-10,287 lbs/acre for the cocktail X seeding rates treatments (Table 3). Four of the top cocktail by seeding rates treatments with >90,000 lbs/acre came mostly from cocktails with 125% seeding rates (i.e. barley seeded at 125%, 2 species seeded at 125%, 5 species seeded at 125%). In terms of seeding rates effect on forage DM yield, overall, seeding at 125% of the cocktail seeding rates seemed to have potential to produce higher forage DM yield than N (normal) and 150% seeding rate.

## Forage Quality

The forage crude protein (CP) generally varied from 8.10% for barley X N seeding rate to 13.7% for 7 species X N seeding rate (Table 3). Overall, the forage CP appeared to be similar for the 3 different seeding rates within each cover crop treatment. All cover crop treatments including both barley (except barley-N) and oats monocultures had sufficient CP for a dry gestating beef cow. For a lactating beef cow, the 7-way species cocktail mixtures consistently exceeded the 11% CP needed by this category of mature beef cattle.

Five of the cover crop cocktail X seeding rate treatments (oats-N, oats-125%, 3 species-125%, 5 species-150%, 6 species-150%) had 70.0% TDN or more compared to others with 65.9 - 69.5% TDN.



**For more information on PCBFA's Cocktail Cover Crop research, please visit [peacecountrybeef.ca](http://peacecountrybeef.ca) or email [info@pcbfa.ca](mailto:info@pcbfa.ca)**