



# Research Facts

Research & Technology Development for the Canadian Beef Industry



## Improving the Digestibility of Hybrid Brome

by Alberta Beef Producers

### Project Title:

Improving neutral detergent fibre digestibility of hybrid brome grass

### Researchers:

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Dr. Greg Penner & Dr. Bill Biligetu (University of Saskatchewan)

### Project Code:

FRG.14.15

### Completed:

November 2018

### Background:

Forages account for approximately 80% of cattle diets throughout their lifetime. Improved forage quality boosts animal performance, and allows for forage resources to be utilized more efficiently. On high forage diets, feed intake is limited by the proportion of neutral detergent fibre (NDF), with a higher proportion of NDF reducing intake. Traditionally forage quality evaluation has relied on chemical composition – the proportion of nutrients like protein and carbohydrate present in a particular sample. However, nutrient availability in terms of digestibility significantly affects animal feed intake and utilization of a specific forage.

### Objectives:

The objective of this study was to breed populations of hybrid brome grass with improved NDF digestibility

### What They Did:

AC Knowles and AC Success hybrid brome grass, along with seven hybrid brome grass breeding lines were evaluated agronomically from 2015 to 2018 for traits such as plant vigour, height, leafiness, disease rating, regrowth, and visual hay yield. From these populations, 175 plants were selected to measure digestibility when incubated in the rumen for 24 hours in porous bags. Samples were analyzed for dry matter digestibility, NDF, and NDF digestibility.

### What They Learned:

The plants evaluated did not differ in growing degrees to flowering or in spring vigour, fall regrowth, or visual yield scores from the other populations, indicating that at least initial selection for high and low NDF digestibility was not affecting other agronomic traits of importance. As plants were measured over two years, they found that NDF digestibility measured in 2016 was not related

to NDF digestibility measured in 2017 in the same populations. This unexpected result led to the creation of “high” and “low” NDF digestibility populations by selecting plants that differed significantly in NDF digestibility from the average over both growing seasons. The plants identified were then transplanted into a greenhouse and were allowed randomly cross among the selected plants to produce seed, creating two new breeding lines.

### ***What It Means:***

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This is a long-term endeavour. Many more selection cycles will be needed before a new hybrid brome grass cultivar with improved NDF digestibility is commercially available. Given that that variation in NDF digestibility in the existing populations was quite large, in some cases varying by more than 10%, there is significant opportunity to improve the NDF digestibility of hybrid brome without affecting other important agronomic characteristics.

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