



New Technologies to Breed Better Barley FRG.01.10

Project Title: The development of molecular markers for improved fiber quality in barley

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Background: Over the past thirty years, the acreage of barley grown for forage in Canada has increased from 200,000 acres to 1.5 million acres. Barley green feed, silage or swath grazing/bale feeding systems can provide a sizeable proportion of the dietary energy and protein needs of beef cattle. Improved fiber digestibility is positively related to dry matter intake and feed efficiency. "Falcon" is a feed barley variety that was found to have 8% lower neutral detergent fiber content than "Tyto", and even lower NDF content than hulled barley grain. Identifying genetic markers in Falcon that are related to fiber digestibility could help barley breeders improve fiber digestibility without affecting yield and disease resistance.

Objective: To identify and validate molecular markers for fiber digestibility in spring barley varieties.

These researchers plan to plant and grow 200 different forage barley developed by crossing the Falcon and Tyto varieties. Greenfeed samples will be harvested at the soft-dough stage (60% moisture) and ADF, NDF and protein content will be measured, and others will be incubated in rumen fluid to determine digestibility. DNA from the samples will also be compared to search for DNA markers associated with these differences in fiber digestibility. The locations of promising DNA markers for NDF content will be examined to determine whether they are located in the same chromosomal regions as genes responsible for lignin development. Additional crosses between Kasota/Falcon, Virden/Falcon and I79207/Falcon will be used to validate markers linked to fiber digestibility.

Implications: Improving the digestibility of barley forage while maintaining forage yield and disease resistance would help improve feed efficiency feedlot cattle as well as improving fall and winter feed quality for the cow herd.

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