

Project

Increasing the production and utilization of alfalfa forages in Canada



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National Dairy Research Strategy investment priority targeted:

- Forage breeding and management for improved yield, resistance, conservation, quality and digestibility

PERIOD: 2018-2022

TOTAL BUDGET: \$1,124,970

Why this research is important:

Forages are the major components in dairy rations and are therefore critical to the economic and environmental sustainability of dairy production in Canada. The dairy cow, as a ruminant, has the unique ability to transform forages that can't be digested by humans into a high value nutritious food - milk. To enhance dairy production efficiency, development of cultivars and improvement of forage crop practices are required to address the three pillars of successful forage production: nutritive value, yield, and persistence. For instance, an economic study from the University of Nevada¹ on the use of a new alfalfa cultivar with a 5% yield increase was estimated to provide a 43% return on investment, showing the potential economic benefits of forage improvement on dairy farms. The elite genetic materials developed in this study will be improved for multiple disease resistance and persistence, which will contribute to a yield increase, under Canadian conditions. The higher nutritive value can be obtained through the development of new breeding material and improved management forage practices.



Research objective:

Improve the nutritive value, yield and persistence of alfalfa-based forages through breeding and crop management.

Project overview:

Under the Dairy Research Cluster 2, a breeding program in which alfalfa germplasm with higher stem energy concentration was developed. It was also determined that the energy to protein ratio was greater at the first harvest of the season (at the flowering stage) with an increasing proportion of grasses in the legume-grass mixtures, and with festulolium (a ryegrass-fescue hybrid) in the mixture. This new phase of the research will continue the genetic selection process to generate high energy content alfalfa populations; evaluate the effectiveness of the selected populations at several sites across Canada; identify crop management practices for an optimal balance between readily fermentable carbohydrates and non-degradable proteins in forages and assess the effect of a better-balanced energy to protein ratio on microbial protein synthesis in the rumen. In addition, the team will also be initiating new research to develop alfalfa populations with improved yield and persistence, identify genes associated with fall dormancy and freezing tolerance, determine better management practices to improve establishment and yield, and study alfalfa-based mixtures and companion crops.

Expected outcomes:

Data and genetic material from alfalfa evaluation trials across Canada will be available to Canadian forage breeders for selecting experimental populations and potentially commercializing new improved cultivars. New crop management practices to increase forage nutritive value, forage yield, and alfalfa persistence will be developed and shared with dairy farmers and crop advisors.

¹Kettle et al. Investing in new varieties of alfalfa: Does-it pay? Fact Sheet 99-31. University of Nevada.

FUNDING PARTNERS:



NOTE: As per the research agreement, aside from providing financial support, the funders have no decision-making role in the design and conduct of the studies, data collection and analysis or interpretation of the data. Researchers maintain independence in conducting their studies, own their data, and report the outcomes regardless of the results. The decision to publish the findings rests solely with the researchers.