

Clean Resources

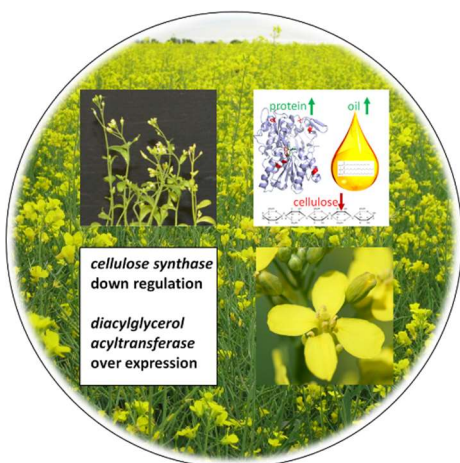
Smart Agriculture and Food Innovation

Smart Agriculture

FUNDING DETAILS

Generation of a Platform for Elevating Protein and Yield in Canola

Interest in plant protein as a nutrient for human consumption is increasing globally. Canola seeds contain 40-45% oil and 22-25% protein, which remains in the meal after oil extraction. Although canola oil generally trades at a premium rate relative to other oilseeds, canola meal is valued significantly lower than other protein sources. Thus, there is a high market value for new canola cultivars with high seed yield and protein content, but with the same oil quantity and quality. *Arabidopsis thaliana* is a plant closely related to canola and is commonly used for studying canola's genetics and development. This project aims to generate an *Arabidopsis*-based screening platform to identify genes that can help to elevate canola seed yield and protein content, while maintaining desirable oil characteristics. Canola lines with high-value protein, oil and seed yield would further the economic growth of canola growers, seed developers and processors in Alberta and Canada.



RECIPIENT:
**University of
Alberta**



PARTNERS:
N/A



TOTAL BUDGET:
\$111,500



AI FUNDING:
\$73,000



PROJECT DATES:
**February 2020 -
March 2022**



PROJECT TRL:
**Start: 2
End: 4**

APPLICATION

The proposed screening technique could lead to a more rapid and reliable approach to test canola genes that can potentially improve seed protein and yield without negatively affecting their oil content. This technique could be directly applied to generate canola lines and protein meal by-products, which would increase the revenue for canola producers. Currently, canola's protein meal goes largely underutilized in the food industry and it is primarily used in animal feeds.



ALBERTA INNOVATES

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PROJECT GOALS

- Confirm that the identified *Arabidopsis* genes can potentially increase oil and protein content.
- Choose the best *Arabidopsis* lines (those without decreases in seed quality, oil content and plant growth) as the platform to identify genes for increased seed protein and yield in canola plants.
- Develop genetic markers for these genes through the application of traditional breeding and modern genomic tools.
- The long-term objective is to use this platform to screen and identify canola genes that can potentially increase protein, oil production and seed yield.

BENEFITS TO ALBERTA

- Provide an innovative platform for targeted canola breeding in Alberta. The platform will be made available to public and private sector breeders in Alberta.
- Generation of new *Arabidopsis* lines, which will be used to efficiently screen and characterize candidate genes to increase protein content and seed yield in canola.
- The use of canola protein in the production of high-value protein products would generate a significant amount of additional value for the Canadian canola industry. It will also reduce the sector's reliance on canola seed exports by increasing value-added processing within Alberta and Canada and by developing oil and protein extraction technologies that maintain the function and utility of canola seed protein.



3 Publications



1 Student Trained



1 Project Job



1 Future Job



1 Patent



1 New
Product/Service

CURRENT STATUS

June 2020

The proposed lab work has been initiated. A MSc student will join the lab to continue the work from September 2020.