ALBERTA INNOVATES

CLEAN RESOURCES

AGRI-FOOD INNOVATION

PRION RESEARCH

Chronic Wasting Disease (CWD) Contamination of Vegetation

This project will examine the potential for chronic wasting disease (CWD) prions to contaminate deer forage and Alberta crops. CWD is a contagious prion disease present in Alberta deer, elk and moose. CWD infectivity is shed through saliva, urine and feces of infected cervids and is known to persist in the environment. Prions are notoriously sticky, however, the ability of CWD prions to be retained upon vegetation is not known. We will determine: i) the binding of CWD prions to a variety of deer forage and Alberta crops, ii) the impact of rainwater washes on CWD removal from plant surfaces iii) the impact of freezing and drying to release CWD bound to plants and iv) if significant amounts of CWD can be taken up from soil by plants.

Deer feeding on natural vegetation

FUNDING DETAILS

RECIPIENT:
University of Alberta, Dr. Judd Aiken

PARTNERS:
Results Driven Agriculture Research

TOTAL BUDGET:
$703,000

AI FUNDING:
$248,000

PROJECT DATES:
JAN 2022 – DEC 2023

PROJECT TRL:
Start: N/A
End: N/A

APPLICATION

The project aims to identify plants species that have an affinity for binding CWD prions and increase the spread of CWD. Outcomes from this project may impact Agriculture and Agri-food sectors policies relating to the possible transmission of CWD from crops. These studies will define the levels of CWD infectivity bound to Alberta crops (biochemical studies) as well as determining whether sufficient CWD infectivity is present to result in disease transmission. Mitigation strategies will be transferred to producers for testing.

ALBERTA INNOVATES

[CORPORATE DIVISION]

AGRI-FOOD INNOVATION

PRION RESEARCH

PROJECT GOALS

- To assess the potential for CWD-contaminated vegetation, especially those plants commonly used as browse by deer, elk and caribou, to be a CWD transmission source.
- To enhance Alberta's scientific capacity for mitigation of the hazard or perception of hazard regarding CWD contamination of agricultural products.
- Determine the ability of CWD prions to bind to Alberta crops.
- Identification of factors and processes that reduce CWD binding to vegetation.
- Determine if CWD infectivity in soil is taken up by plant roots.
- Provide hands on training of HQP in prion diseases and plant biology.

BENEFITS TO ALBERTA

- The project will define CWD prions interaction with aerial vegetation and roots.
- The project will improve ecological modelling of CWD transmission.
- Will inform the Alberta Agriculture industry of crop's ability to interact and retain CWD infectivity.
- Work will also aid in identifying and controlling risk and perceived risk to agricultural land and products.

2-3 Publications

2-5 Students Trained

2-4 New Products/Services

3-5 Scientists

>10 Future Jobs c

CURRENT STATUS

APR 2023

We have found CWD prions to bind vegetation (including wheat, clover, white clover, red clover, alsike clover and alfalfa) with little infectivity released by water washing. These studies indicate that prion infectivity (which is shed in saliva by CWD-infected deer and elk) would remain on the vegetation and thus bioavailable. Our studies have also tentatively identified a herbicide that when applied to vegetation reduces the binding of CWD prions.

Publications: Kuznetsova et al., Movement of Chronic Wasting Disease Prions in Prairie, Boreal and Alpine Soils. *Pathogens* 2023, *12*(2), 69; https://doi.org/10.3390/ pathogens12020269.