



AgroECOSYSTEMS

ACROSS CANADA, OVER 60 MILLION HECTARES OF LAND IS USED FOR PRIMARY AGRICULTURE, contributing to our economy, providing essential resources, and ensuring food security.

IMPACTS OF CLIMATE CHANGE INCLUDE:

Physiological stress due to higher temperatures

Increased invasive insect pests, weeds and pathogens

Declining populations of beneficial insects, such as pollinators

Potential for new agricultural opportunities

GENOMICS

Every living being has a genome: the complete set of genetic information (DNA) that provides instructions for its development and functioning. Using genomic tools, scientists can assess populations' ability to adapt to changing environments and predict whether populations will be vulnerable to climate change.

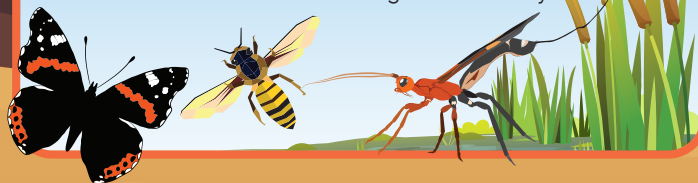


RESEARCH ACTIVITIES

INSECTS

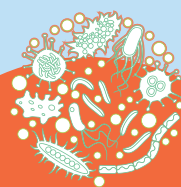
Investigating the genetic diversity of insects, identifying species that have undergone significant declines, and exploring the effects of land use and climate change on populations.

Using insect specimens from the Canadian National Collection, as well as present-day samples, will allow us to examine genomic changes associated with climate change over time. Newly collected specimens will be maintained as a baseline for insect genetic diversity.

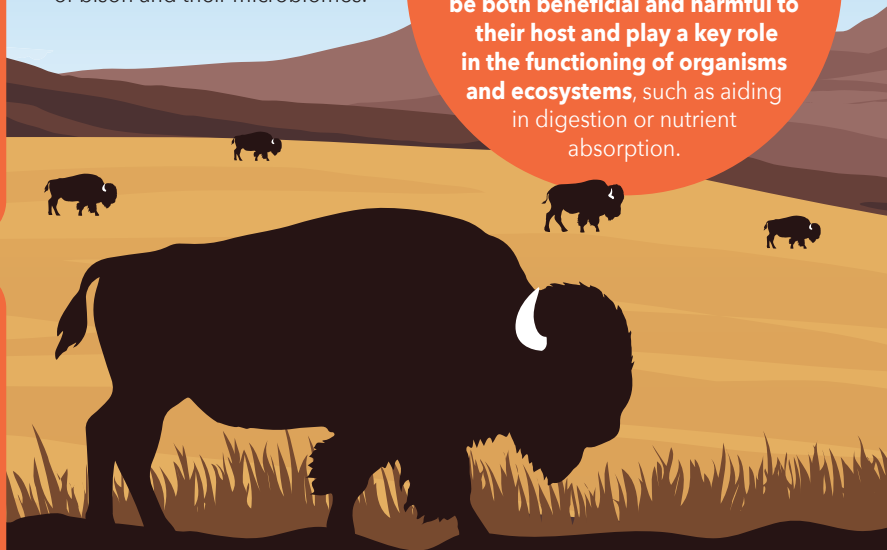


BISON

Developing genomic tools to assess the genetic composition of bison sub-species, and examining the effect of climate change, environmental contaminants, and pathogens on the health of bison and their microbiomes.



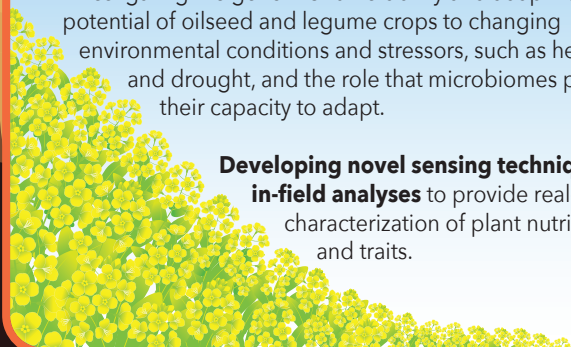
Microbiomes are communities of microorganisms, including fungi, bacteria and viruses. **Microbes can be both beneficial and harmful to their host and play a key role in the functioning of organisms and ecosystems,** such as aiding in digestion or nutrient absorption.



CROP LAND

Investigating the genomic vulnerability and adaptive potential of oilseed and legume crops to changing environmental conditions and stressors, such as heat and drought, and the role that microbiomes play in their capacity to adapt.

Developing novel sensing techniques for in-field analyses to provide real-time characterization of plant nutrients and traits.



Climate change is influencing disease dynamics in wildlife as the ranges of both hosts and pathogens shift. We are characterizing pathogens that infect bison, assessing their prevalence, and developing new genomic tools to provide better disease surveillance.

OUTCOMES

GENERATE

foundational genomic data and resources

PREDICT

the capacity of agroecosystem species to adapt to future climate scenarios

DEVELOP TOOLS

to monitor the impacts of climate change on species

PROVIDE SCIENCE ADVICE

to inform climate-resilient management and conservation