Embrapa

48 anos

# EMBRAPA and Agriculture Agri-Food Canada (AAFC) Cooperation

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**1st Brazil-Canada Agriculture Forum**
**The ecosystem for Brazilian and Canadian Ag-Techs**

MINISTÉRIO DA AGRICULTURA, PECUÁRIA E ABASTECIMENTO

PÁTRIA AMADA BRASIL GOVERNO FEDERAL

# EMBRAPA- Mission

*Provide research, development, and innovation solutions for the sustainability of agriculture and for the benefit of Brazilian society*

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# EMBRAPA- A Robust Research and Innovation

- Employees:8,200
- Total Scientists: 2,200

- 43 Research Centers
  - 11 National Thematic Centers
  - 15 National Product Centers
  - 17 Ecorregional/Agroforestry Centers

- 34 Portfolios of projects

- 78 breeding programs

- Scientific Cooperation- Labex US - Canada and Europe

- Technical Cooperation - Africa and Latin America

# EMBRAPA - International Cooperation

✓ **Platforms**

➢ **Scientific Cooperation**

- *North America, Europe and Asia*

➢ **Technical Cooperation**

- *Africa and Latin America*

✓ **Projects**

**88** *ongoing projects*
**27** *partner countries*
**62** *foreign partner institutions*

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# National Portfolios

Irrigated Agriculture

Nutrition, Safety and Health

Amazon

Aquaculture

Automation, Precision and Digital Farming

Biotechnology Applied to Agribusiness

Coffee

Meat

Managing Drought in the Semiarid

Diversification and Market Niches

Energy, Chemistry and Biomass Tech

Fibers and biomass for industrial use

Forestry

Temperate Fruit

Tropical fruit

Grains

Vegetables

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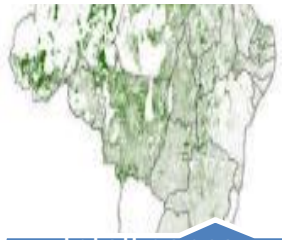
# National Portfolios

Organizational Innovation

Social Innovation in Agriculture

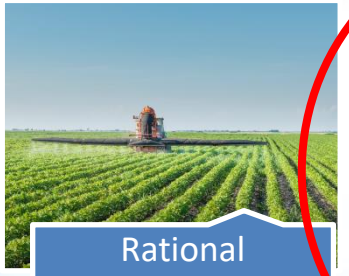
Biological Inputs

Livestock Crop and Forest Integration

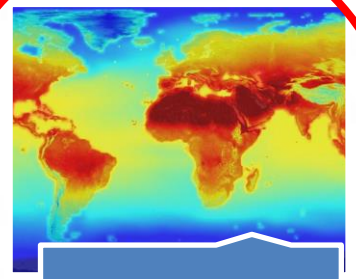


Intelligence, Management and Territorial Monitoring

Milk



Rational Management of Pesticides



Climate changes

Nanotechnology

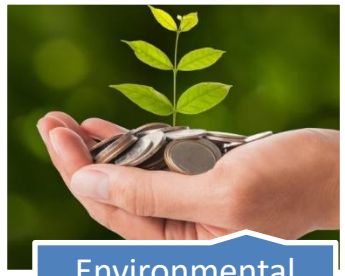
Agriculture Nutrients

Pastures

Genetic Resources

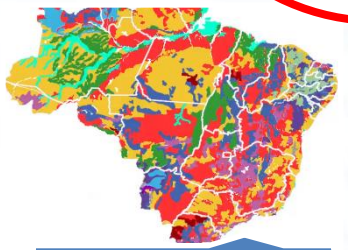
Animal Health

Vegetable Health



Environmental services

Ecologically Based Production Systems



Soils of Brazil

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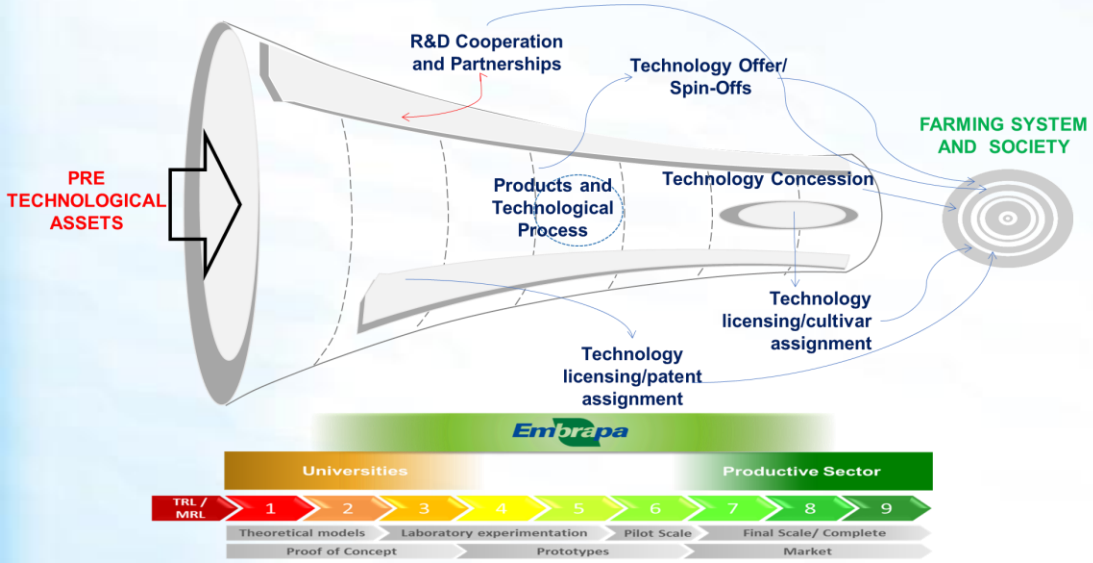
# EMBRAPA- Open-innovation with the Productive Sector

- ✓ Projects in private-public partnerships
- ✓ Innovation-driven projects
- ✓ Co-funding
- ✓ Sharing of Intelectual Property rights

# EMBRAPA-Technological Assets




## Technological assets

- ✓ ***Cultivars***
- ✓ ***Animal lineages and races***
- ✓ ***Agricultural Inputs***
- ✓ ***Industrial Processes***
- ✓ ***Agricultural Processes***
- ✓ ***Machines and equipments***
- ✓ ***Softwares***
- ✓ ***Cartographic assets***

**TECHNOLOGY READINESS MONITORING**

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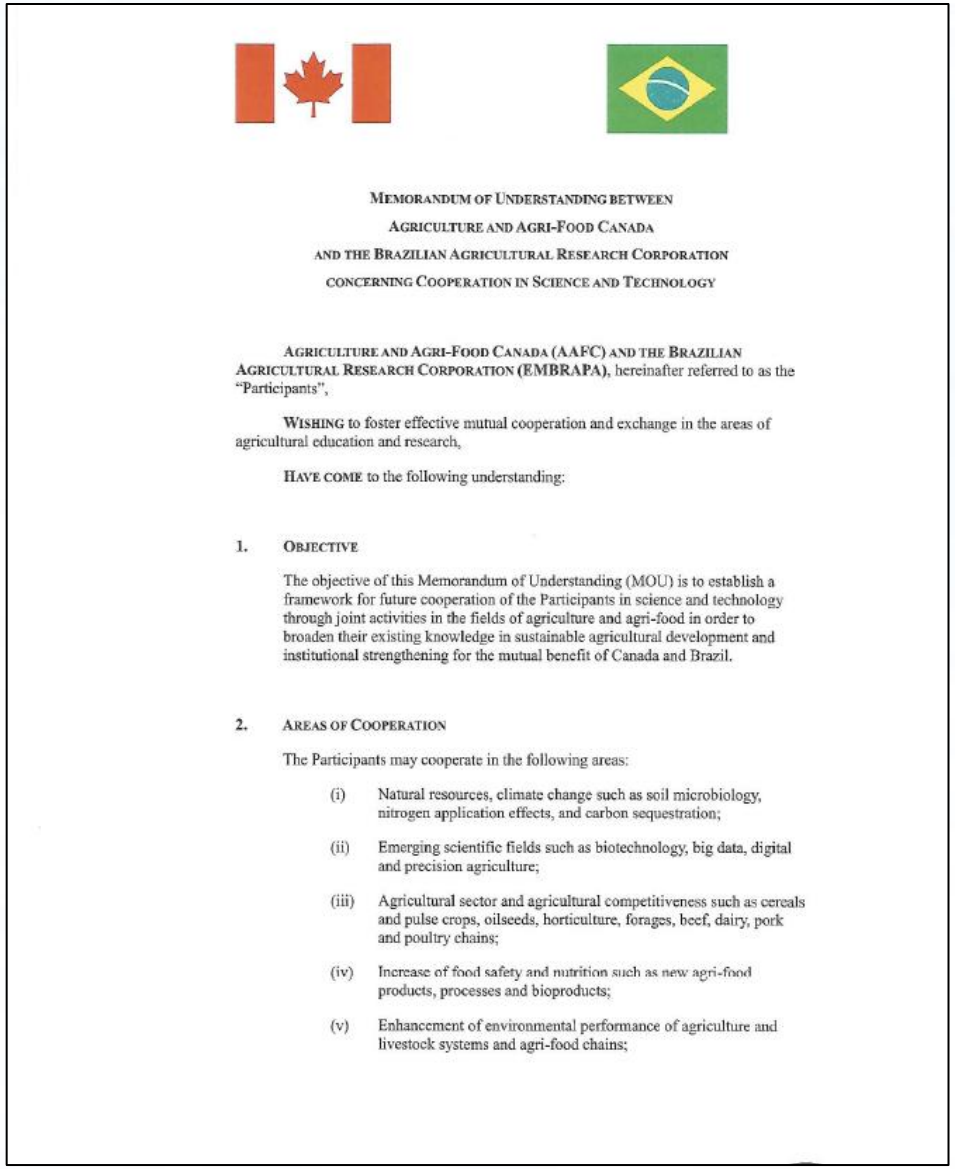
# EMBRAPA- Agriculture Agri-Food Canada Agreement



MEMORANDUM OF UNDERSTANDING BETWEEN
AGRICULTURE AND AGRI-FOOD CANADA
AND THE BRAZILIAN AGRICULTURAL RESEARCH CORPORATION
CONCERNING COOPERATION IN SCIENCE AND TECHNOLOGY

AGRICULTURE AND AGRI-FOOD CANADA (AAFC) AND THE BRAZILIAN AGRICULTURAL RESEARCH CORPORATION (EMBRAPA), hereinafter referred to as the "Participants",

WISHING to foster effective mutual cooperation and exchange in the areas of agricultural education and research,

HAVE COME to the following understanding:

1. OBJECTIVE

The objective of this Memorandum of Understanding (MOU) is to establish a framework for future cooperation of the Participants in science and technology through joint activities in the fields of agriculture and agri-food in order to broaden their existing knowledge in sustainable agricultural development and institutional strengthening for the mutual benefit of Canada and Brazil.

2. AREAS OF COOPERATION

The Participants may cooperate in the following areas:

(i) Natural resources, climate change such as soil microbiology, nitrogen application effects, and carbon sequestration;

(ii) Emerging scientific fields such as biotechnology, big data, digital and precision agriculture;

(iii) Agricultural sector and agricultural competitiveness such as cereals and pulse crops, oilseeds, horticulture, forages, beef, dairy, pork and poultry chains;

(iv) Increase of food safety and nutrition such as new agri-food products, processes and bioproducts;

(v) Enhancement of environmental performance of agriculture and livestock systems and agri-food chains;

Agriculture and Agri-Food Canada

# EMBRAPA- Agriculture Agri-Food Canada Agreement

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Agriculture and Agri-Food Canada

- ✓ **MoU signed in July 2020. Valid for a period of 5 years.**
- ✓ **Expansion of Labex Program to Canada**
  - **Biotechnology applied to agriculture**
  - **Digital Agriculture and automation**
  - **Genetics on wheat and pulse crops**
  - **Climate change adaptation and resilience**

Work plans and proposals waiting for financial support

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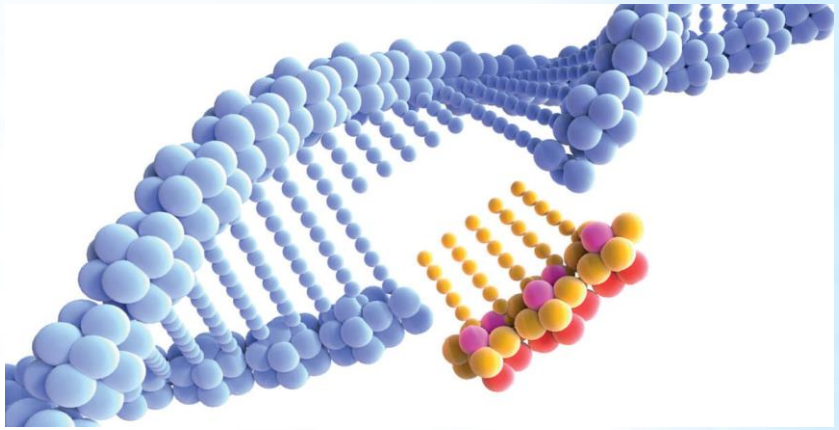
# Gene Editing Applied to Agriculture

- To identify broad spectrum of disease resistance targets to apply in multiple crops and pathogens such as grape and wheat

- To cooperate and collaborate on projects aiming to improve N fixation and/or N uptake efficiency in legumes such as common bean and alfalfa



- Further research progress on the enhancement of seed protein content in legumes such as soybean

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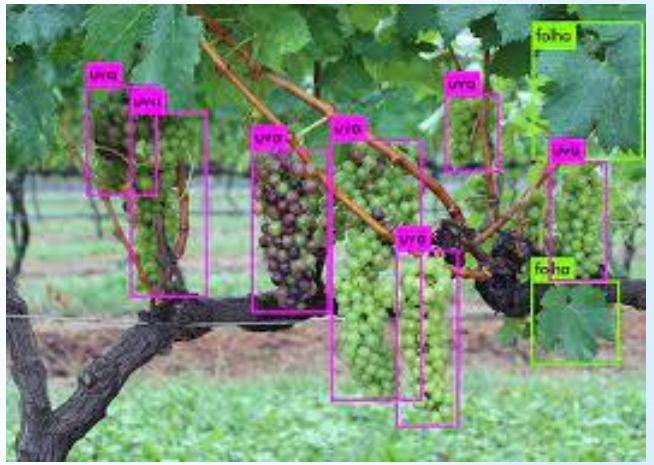
# Precision Agriculture and Artificial Intelligence

Create deep learning datasets and models for apple yield detection and robotics

Promote the use of RADARSAT Constellation Mission (RCM) and SENTINEL satellite on crop classification with data from Brazil and Canada

Develop data sharing protocols, integrate disease data, design disease risk mapping, biovigilance platforms

Problems with big data, develop ICASA data standard protocols to ensure compliance with international data sharing in Precision Agriculture



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# Climate Change Research

Impact of N inputs into Conservation cropping systems with cover crops & crop rotations: microbiome, GHG monitoring, N balance, crop performance, calibration and validation of simulation models for scenario analyses and scaling-up emission data

Impacts of Soil Conservation Practices on Soil Carbon Sequestration: sequestering of $CO_2$ from the atmosphere and promote soil C accumulation and stabilization; Understanding the impact of different crop/pasture residues on soil organic C accumulation; Evaluate the overall GHG balance of conservation practices (C sequestration vs GHG emissions)

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# Germplasm Enhancement & Genetics

Exchange between Canada and Brazil of more recently developed wheat and beans germplasm

Testing of Canadian germplasm for resistance to Wheat Blast caused by *Magnaporthe oryzae* pathotype *triticum* (MoT)

bacterial blight, root rot resistance and early maturing germplasm on dry bean

Bio-fortification evaluations of wheat germplasm

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# Thank you

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