

Shaping Regional Agriculture and Sustainability through Canadian Technology

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Canada's Agriculture System



- Employs 2.1M people
- Provides 1 out of 9 Canadian jobs
- Generates \$134.9B (6.8%) of Canada's GDP
- Advanced technologies are reshaping the sector

Source: [AgricultureCanada](#)

Context

- Agricultural technologies provide solutions to farmers and growers to:
 - Enhance efficiency
 - Reduce costs
 - Address sustainability
- However, little is known about:
 - Canadian agricultural technology producers/firms
 - Business & sustainability benefits to ag tech users in Canada
 - Spatial connections between ag-tech firms and rural farming

Research Questions

- What are the characteristics of Canadian agricultural technology firms?
 - Location: urban vs. rural, regional differences
 - Application areas and types of technology
- What benefits do Canadian agricultural technology firms emphasize?
 - Business & sustainability benefits
- Is there a relationship between organizational structure and sustainability?
 - Organizational structure
 - Gender diversity on management teams

Methods

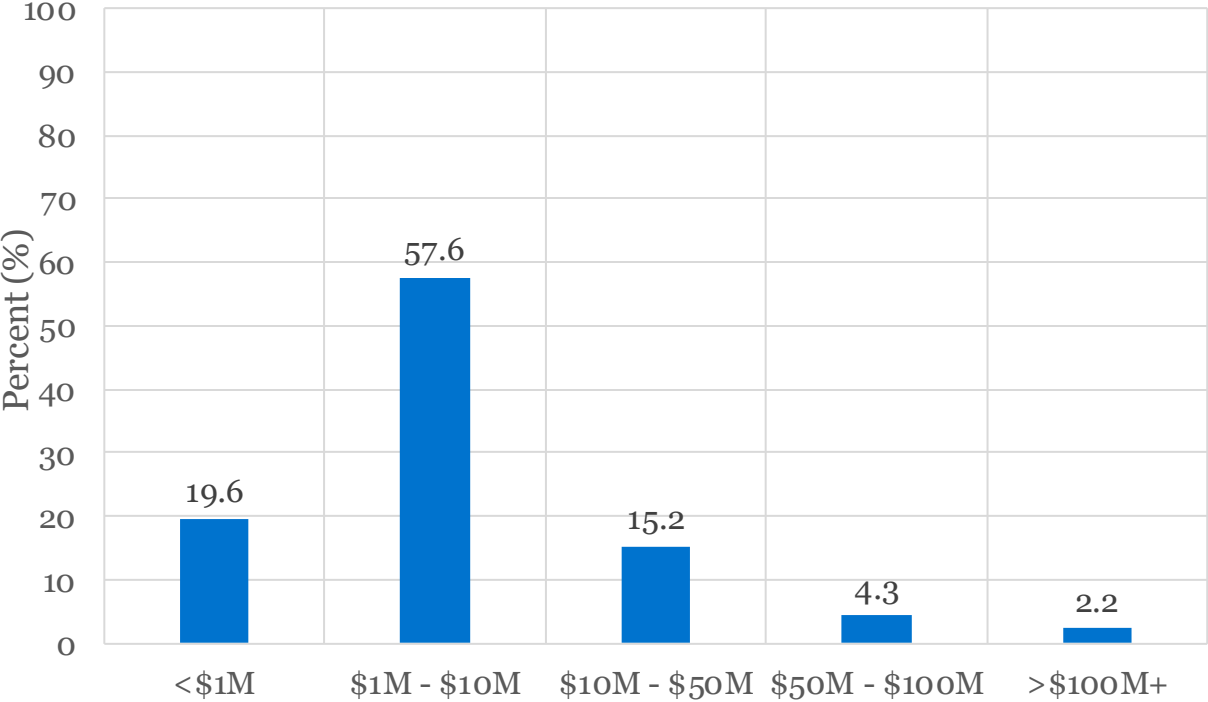
- Used Crunchbase to identify 770 firms classified as 'Agriculture' in Canada
- Developed unique database of 202 organizations that met the following criteria:
 - Headquartered in Canada
 - Developing agriculture technologies
 - Active business operations
- Collected additional information from firm websites
- Coded variables:
 - Headquarter locations (urban vs. rural, region), organization type, structure, & leadership
 - Target use cases & agricultural applications, technologies, intended user benefits
- Limitations: information from Crunchbase & company websites only

PRELIMINARY FINDINGS

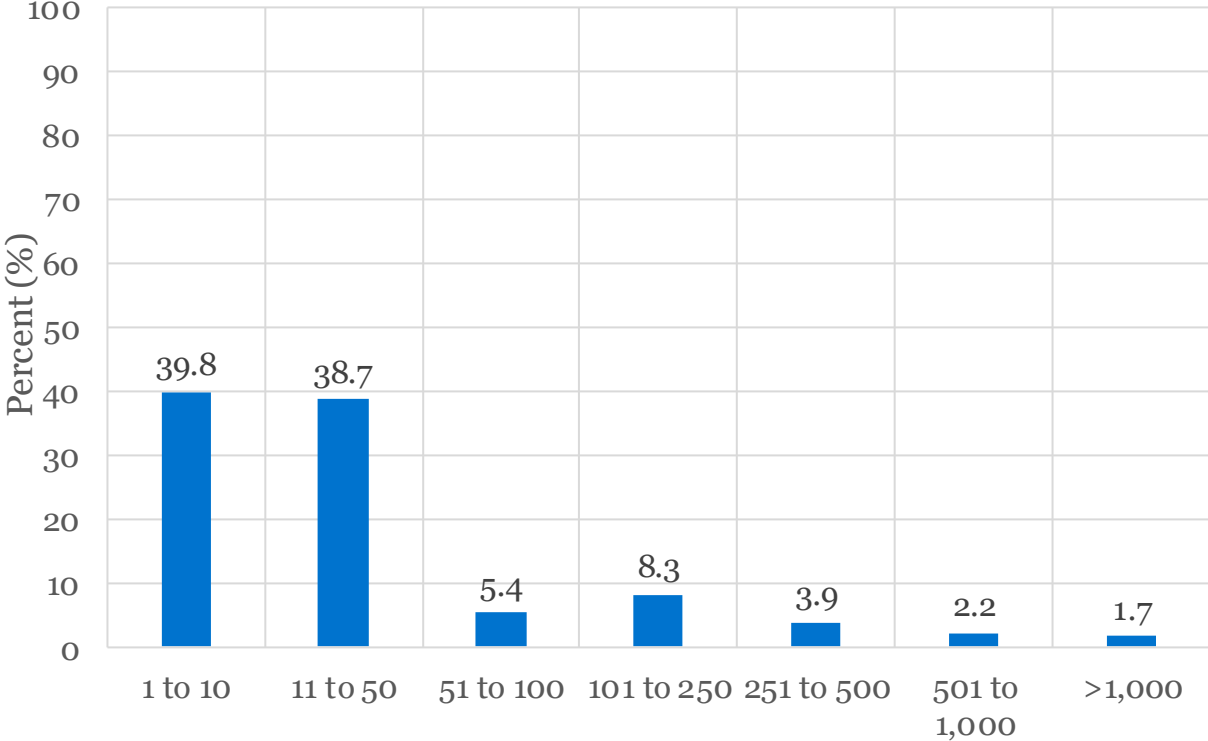
ORGANIZATION SIZES & TYPES

Organization Revenue & Size

Ag-Tech Organizations by Annual Revenue

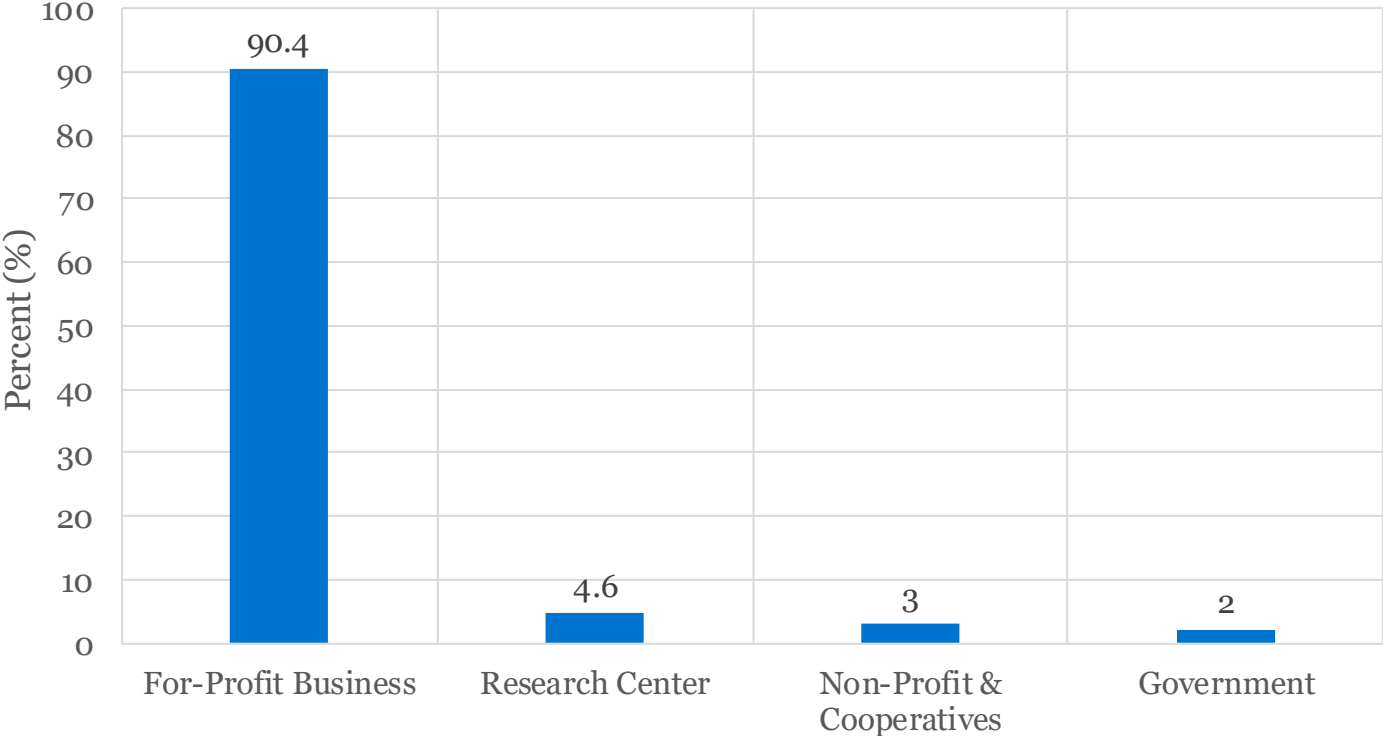


Ag-Tech Organizations by Number of Employees

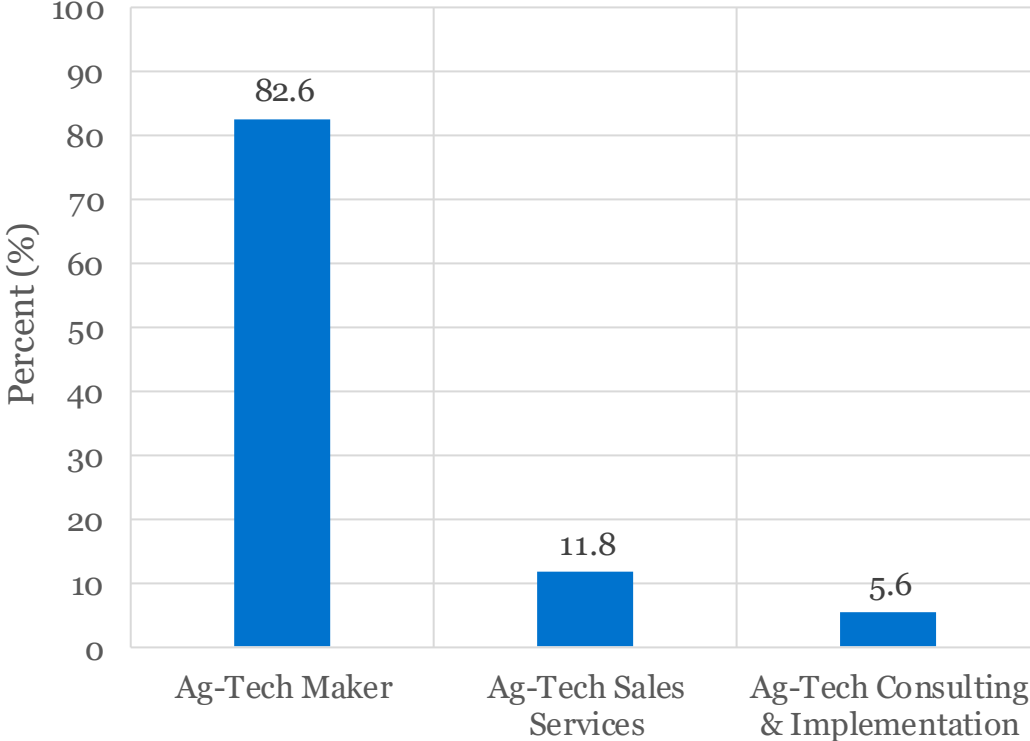


Organization Types

Ag-Tech Organizations by Type



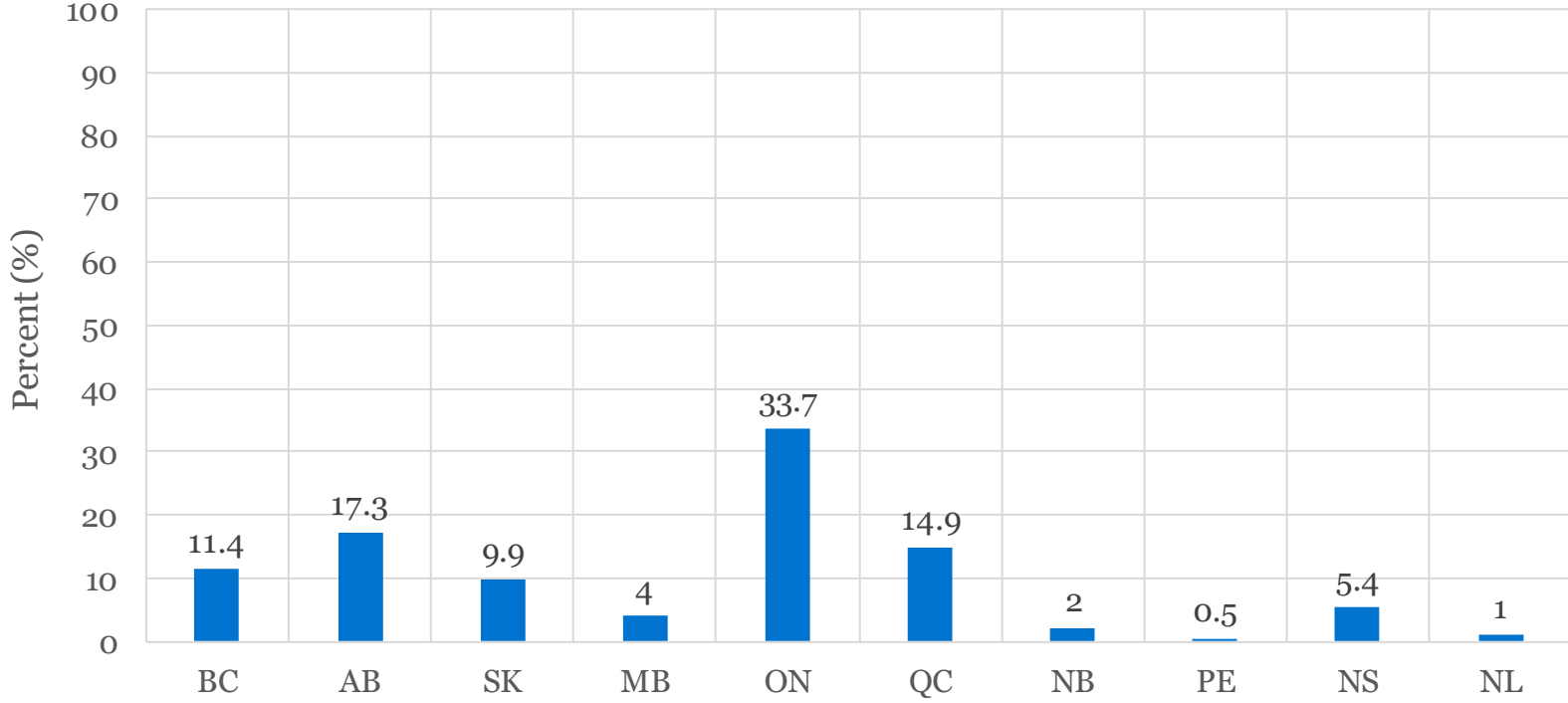
For-Profit Ag-Tech Organizations by Type



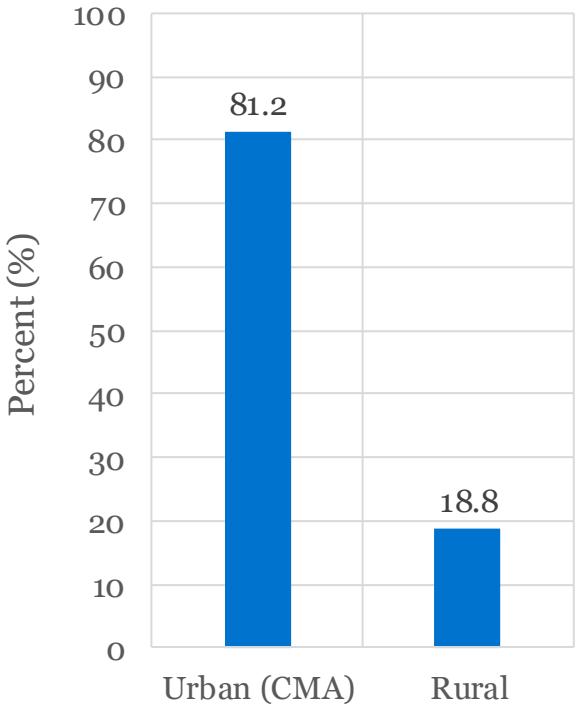
LOCATION

Location of Ag-Tech Organizations

Ag-Tech Organizations by Province

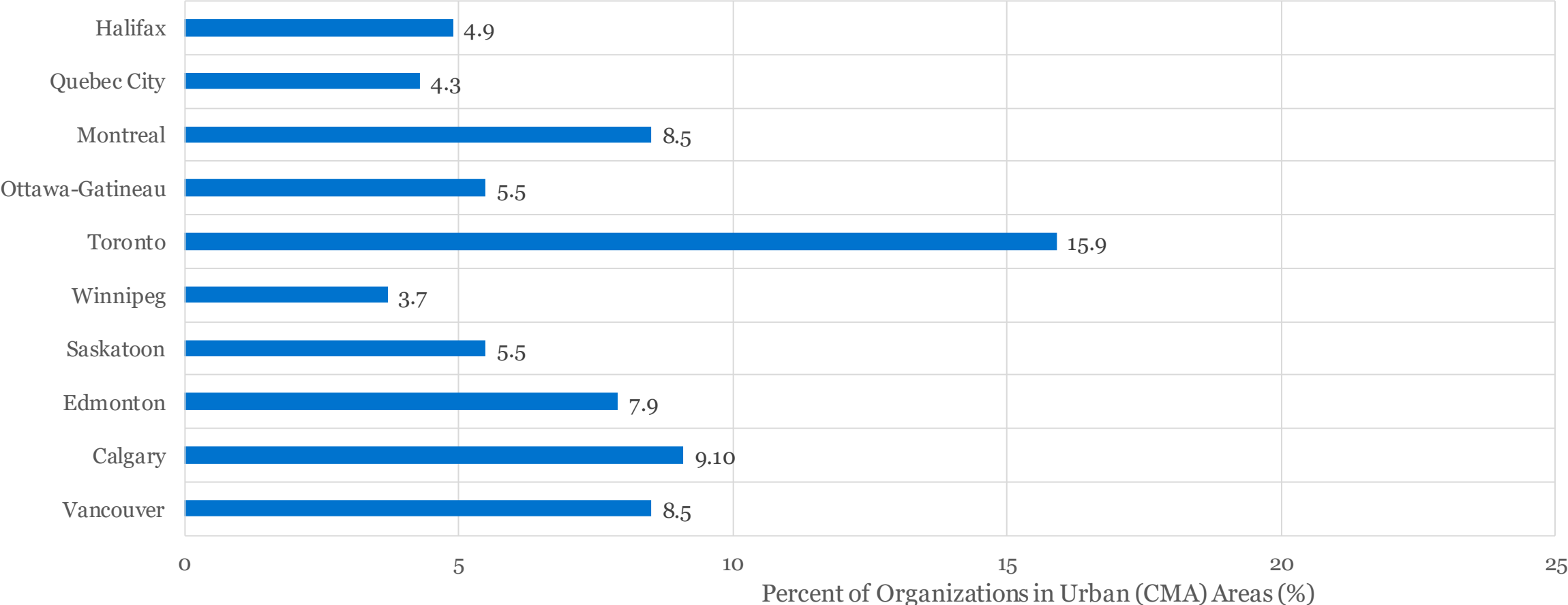


Ag-Tech Organizations: Urban vs. Rural



Location of Ag-Tech Firms: Urban (CMA) Areas

Ag-Tech Organizations by Top 10 Urban (CMA) Areas



Location of Ag-Tech Firms: Rural Areas

BC

- Campbell River
- Chase
- Clearwater
- Summerland

AB

- Camrose
- Carstairs
- Irricana
- Lloydminster

SK

- Arborg
- Morden

MB

- Beechy
- Kindersley
- Naicam
- Norquay
- Rosetown
- Senlac
- Sherwood
- Swift Current

ON

- Ayr
- Blenheim
- Chatham
- Cornwall
- Essex
- Exeter
- Lindsey
- Mitchell
- McNab-Braeside
- Tavistock

QC

- Drummondville
- Gaspé
- La Pocatière
- Napierville
- Normandin
- Saint-Germain-de-Grantham

NB

- Chamcook

PE

- Victoria

NS

- Great Village
- Kentville

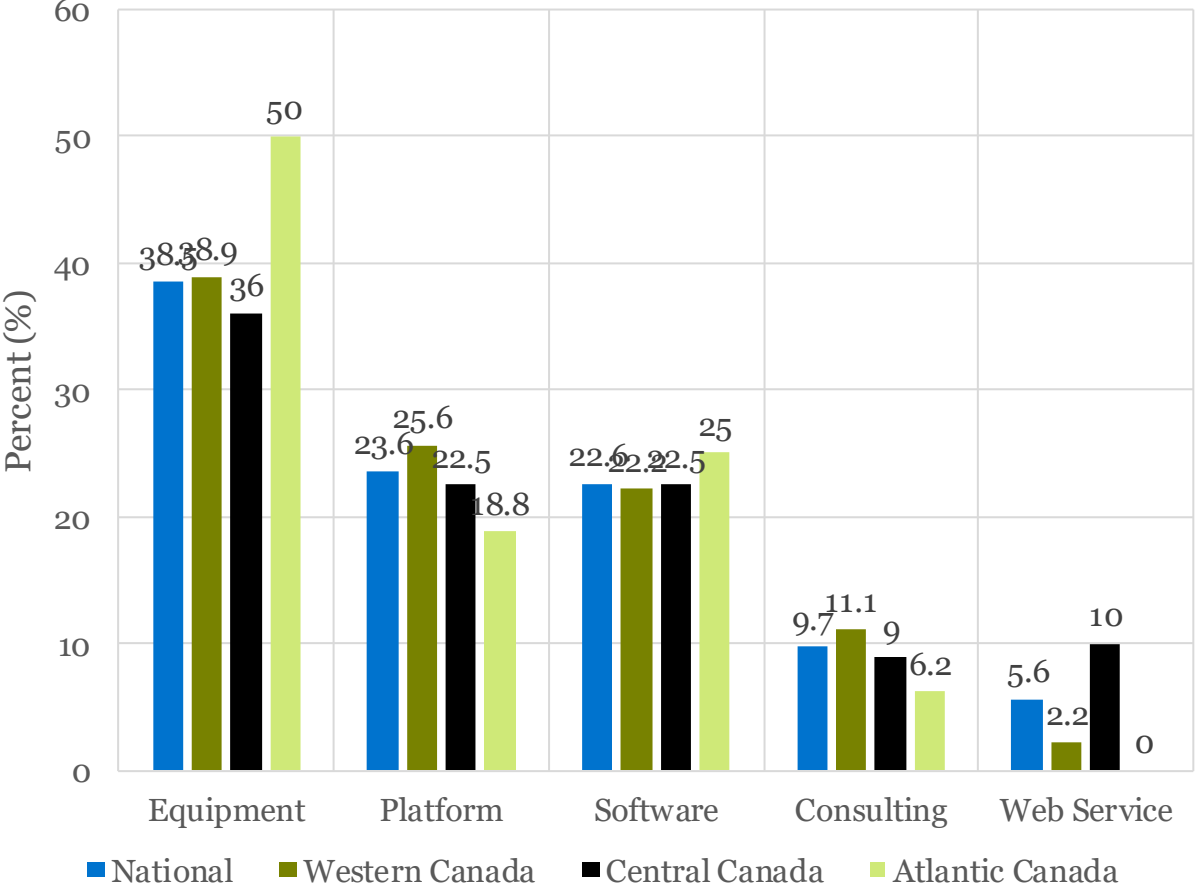
NL

- (No rural-based firms)

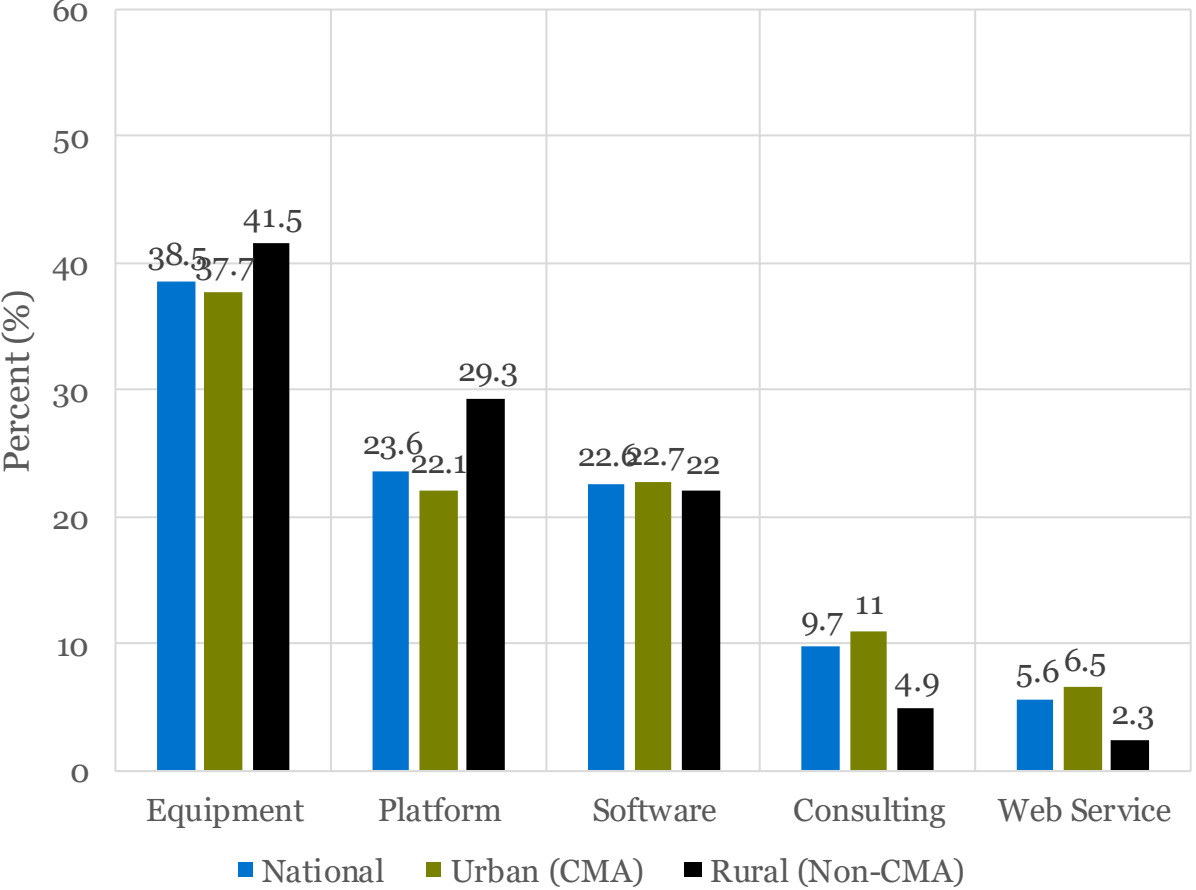
SCALES & TYPES OF TECHNOLOGIES

Types of Canadian Agricultural Technologies

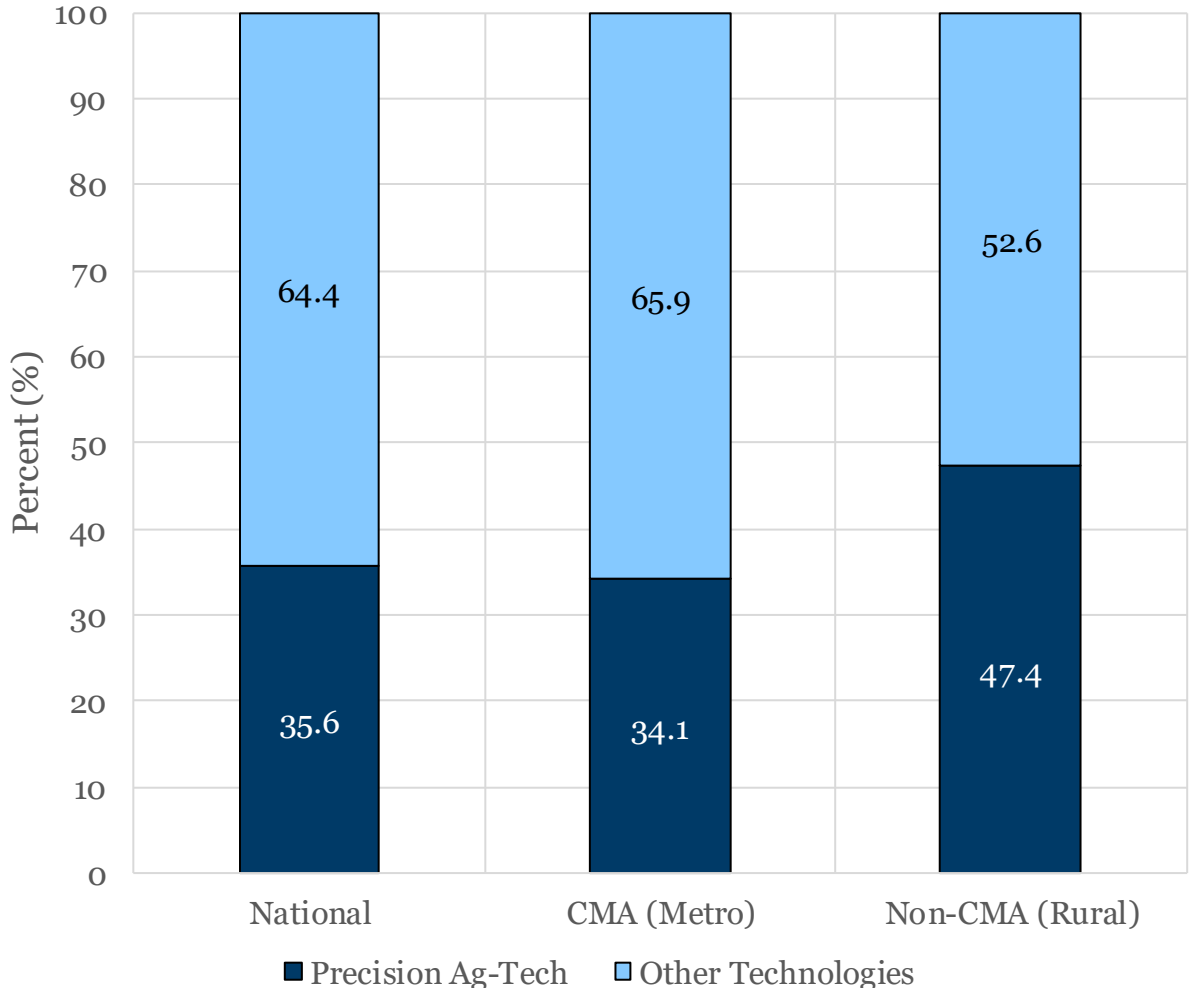
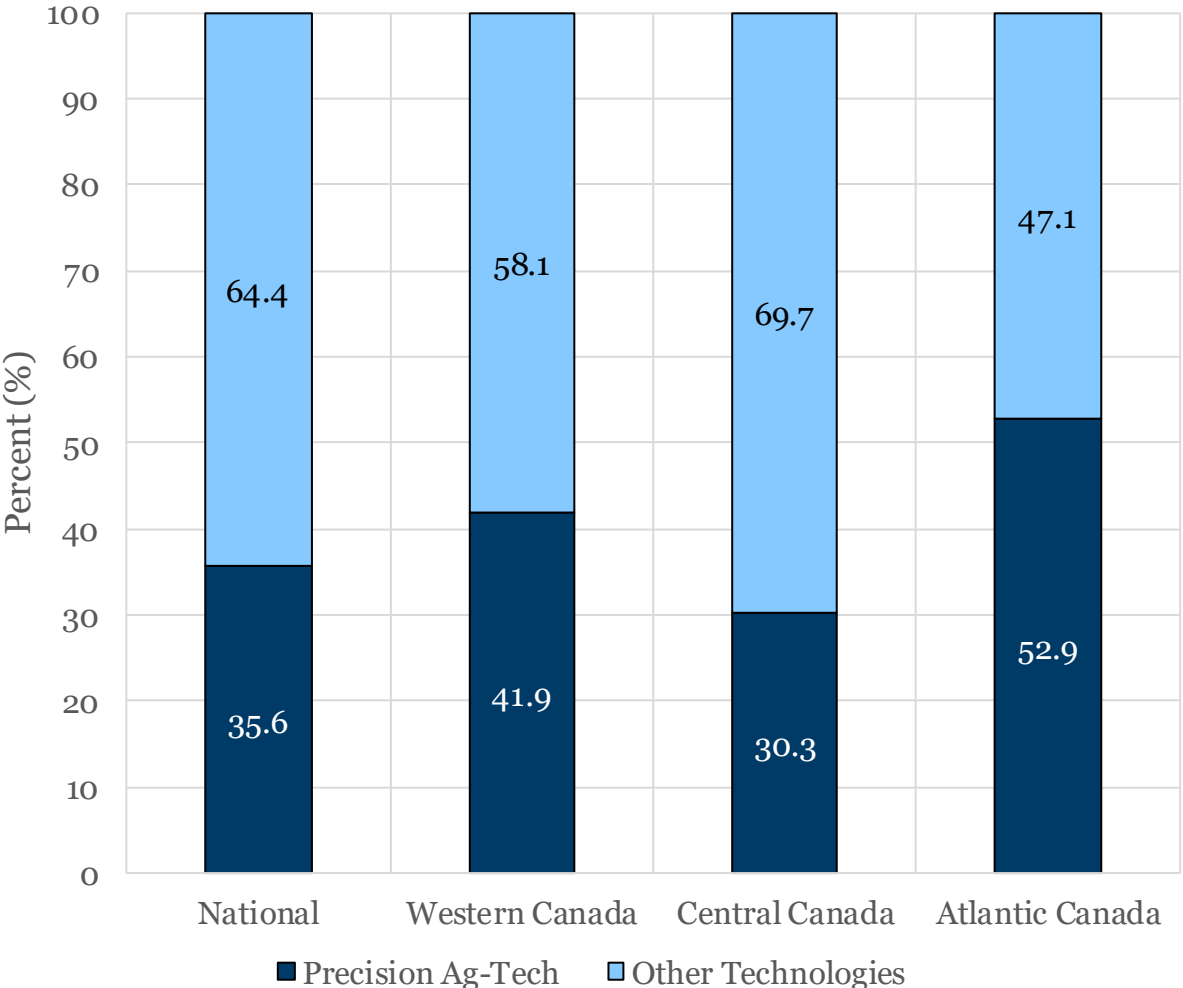
Technology Types by Region



Technology Types by Urban (CMA) vs. Rural

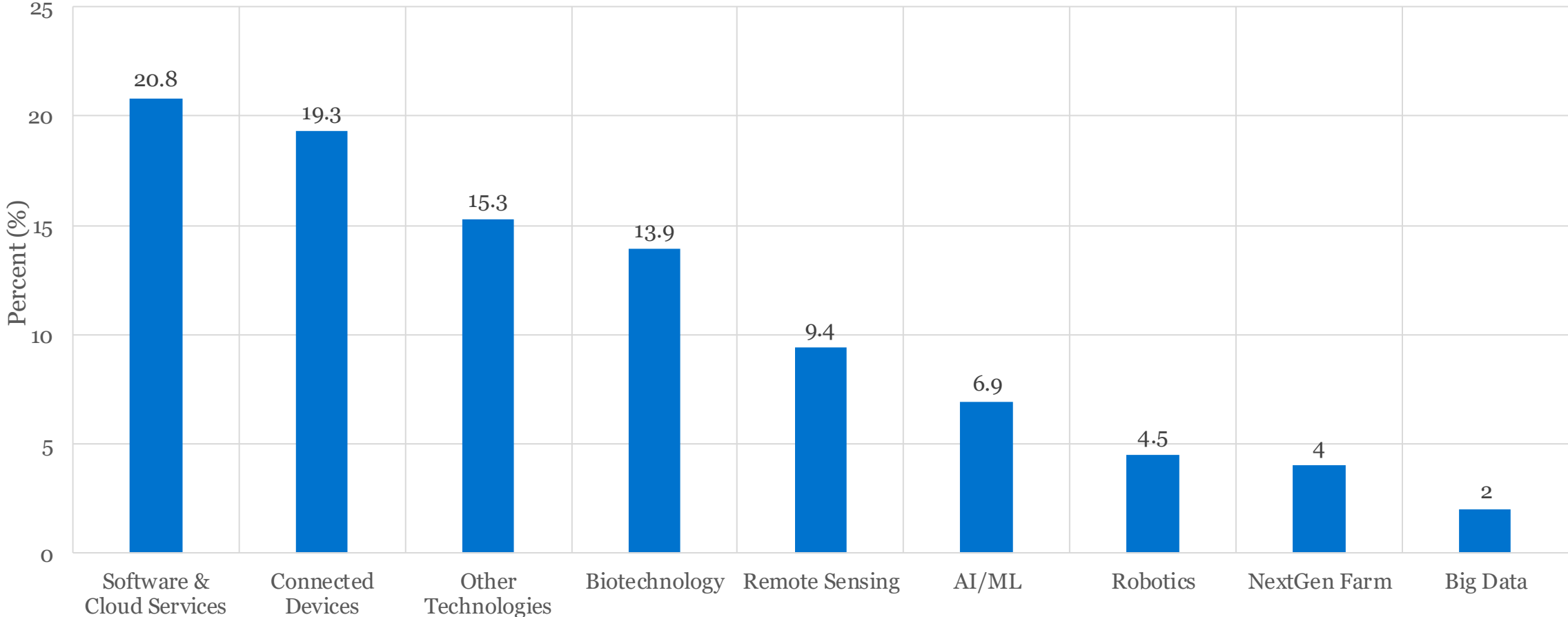


Precision Agriculture vs. Other Technologies: Geographic Differences



Supporting Technologies

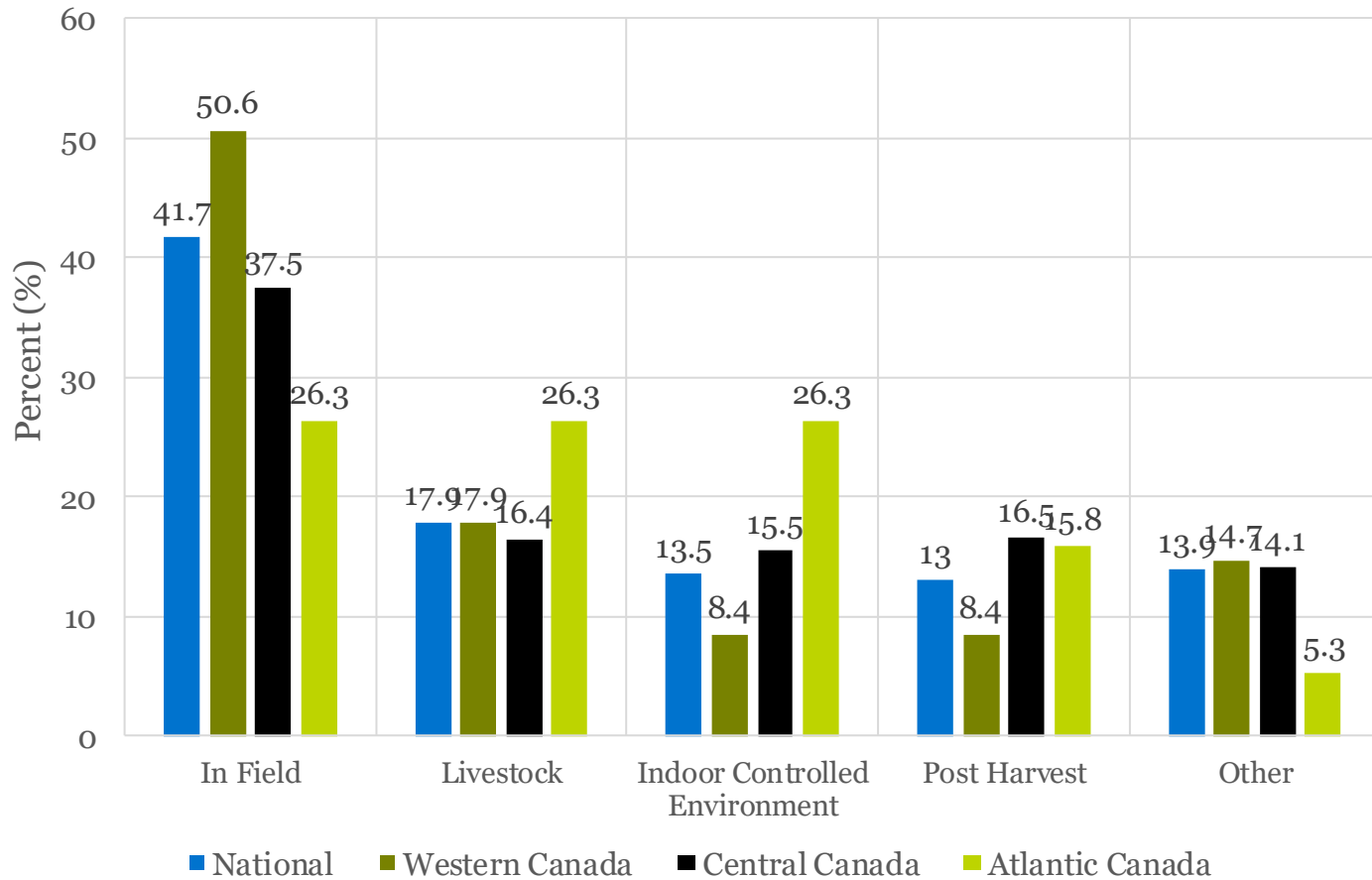
Types of Supporting Technologies



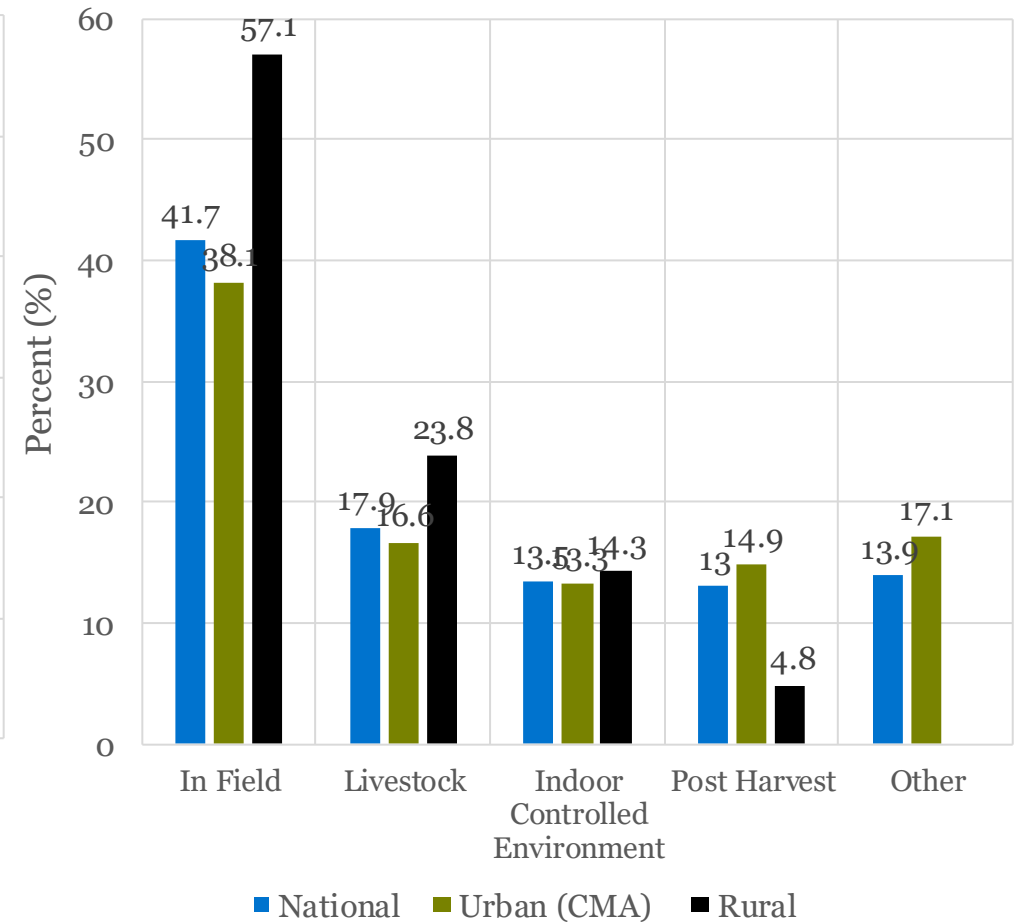
TARGET USE CASES

Agricultural Applications

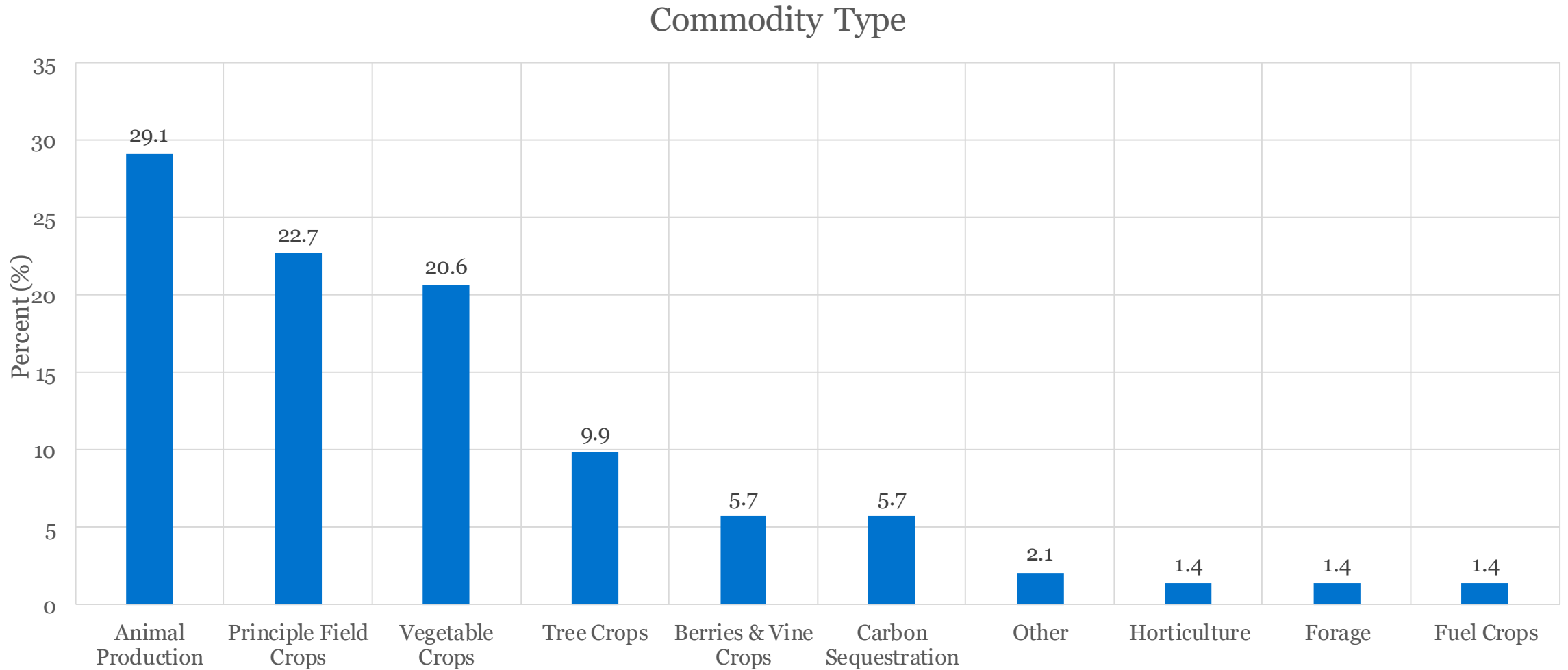
Agricultural Applications by Province



Agricultural Applications by Urban (CMA) vs. Rural



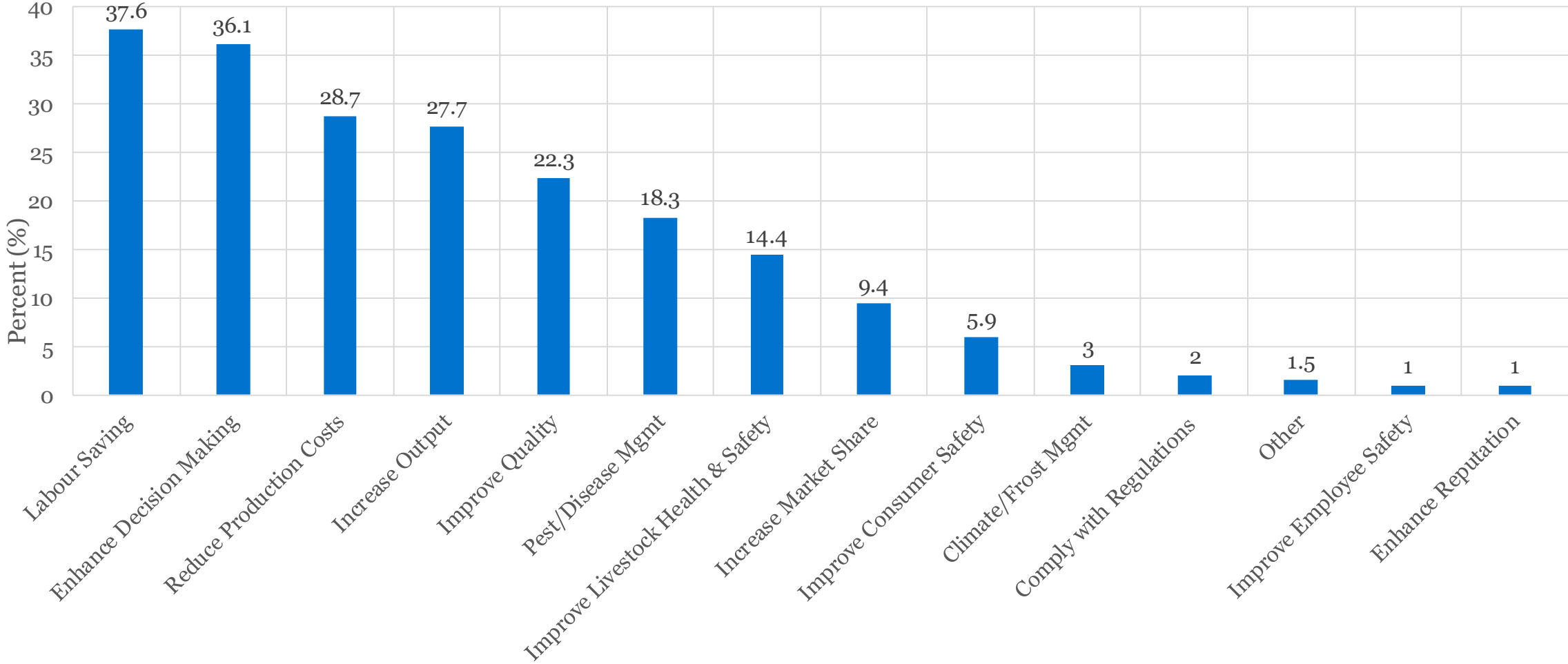
Application by Commodity Type



USER BENEFITS

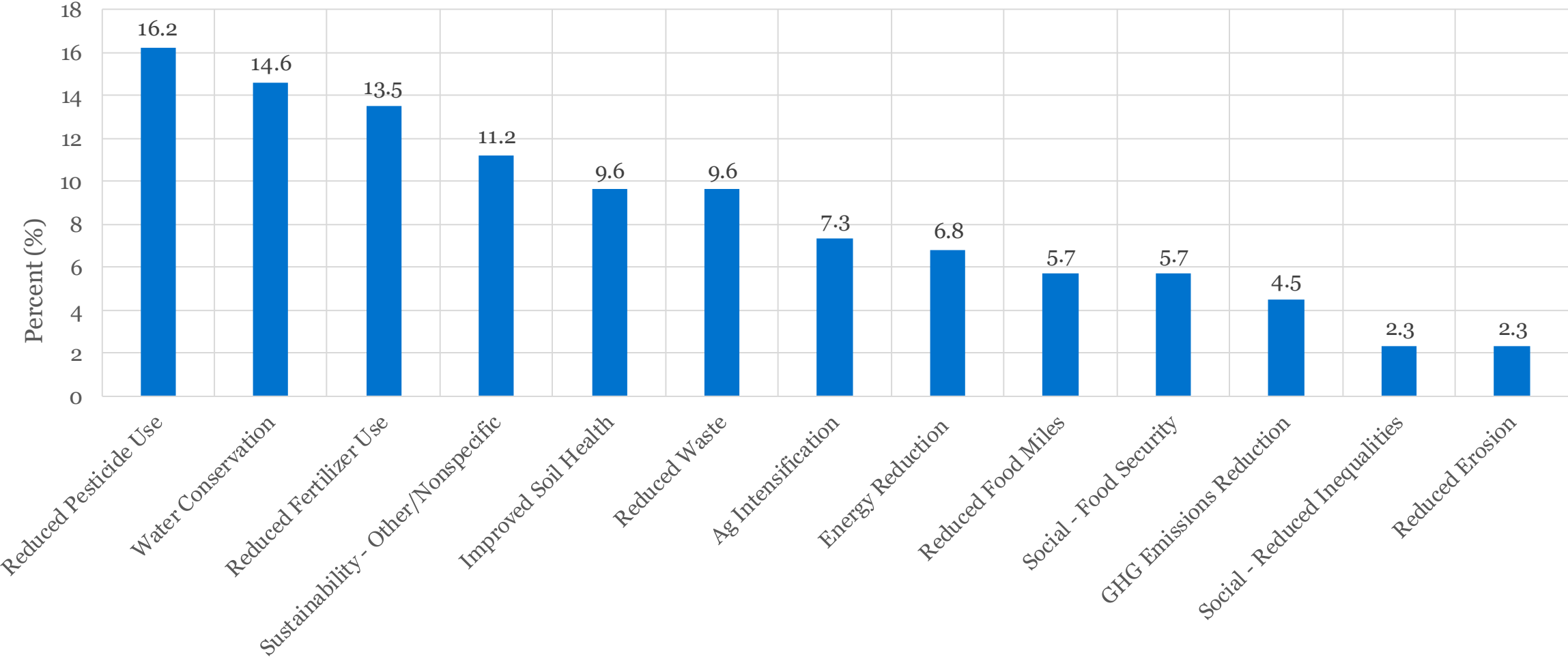
Business Benefits

Business Benefits

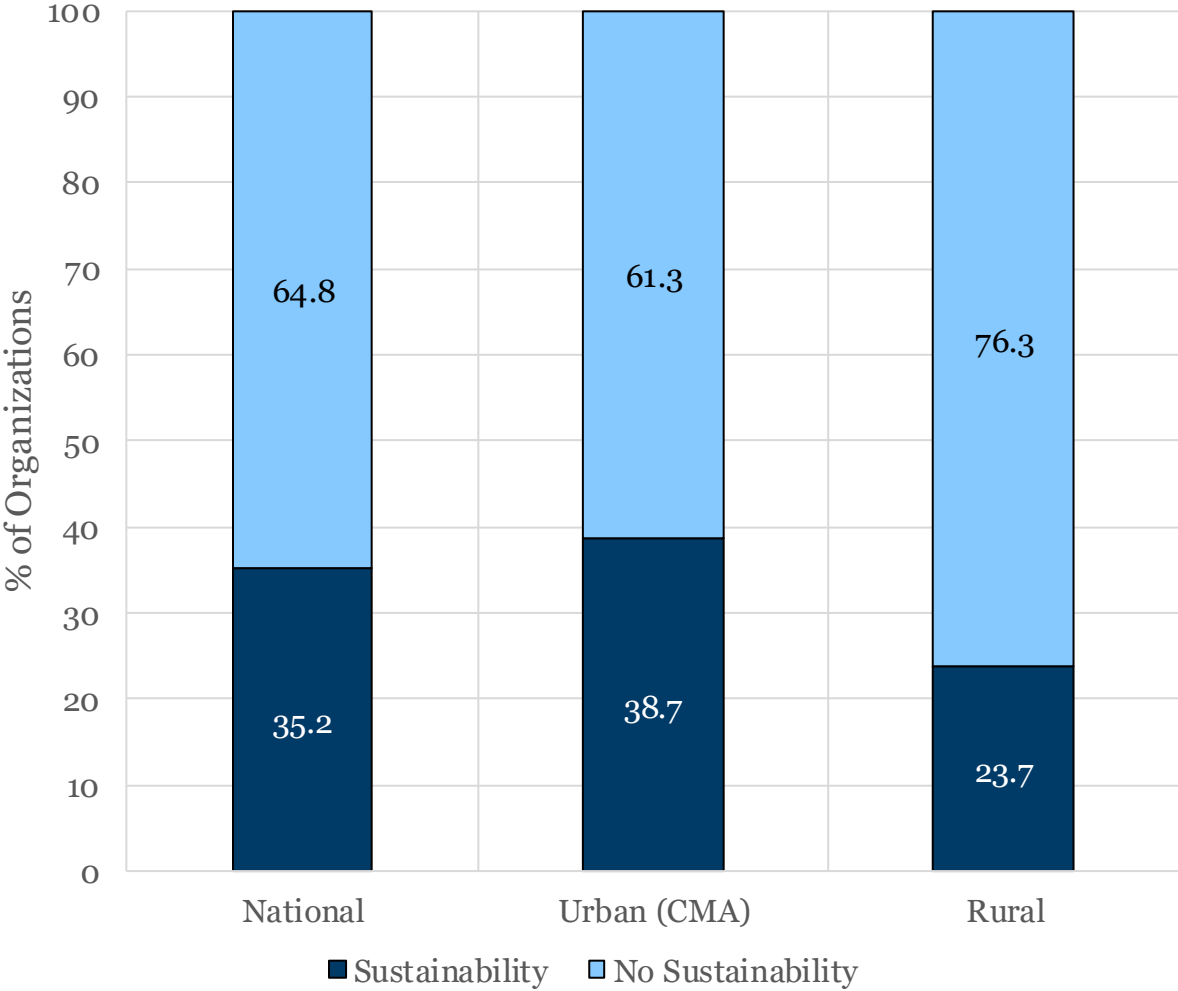
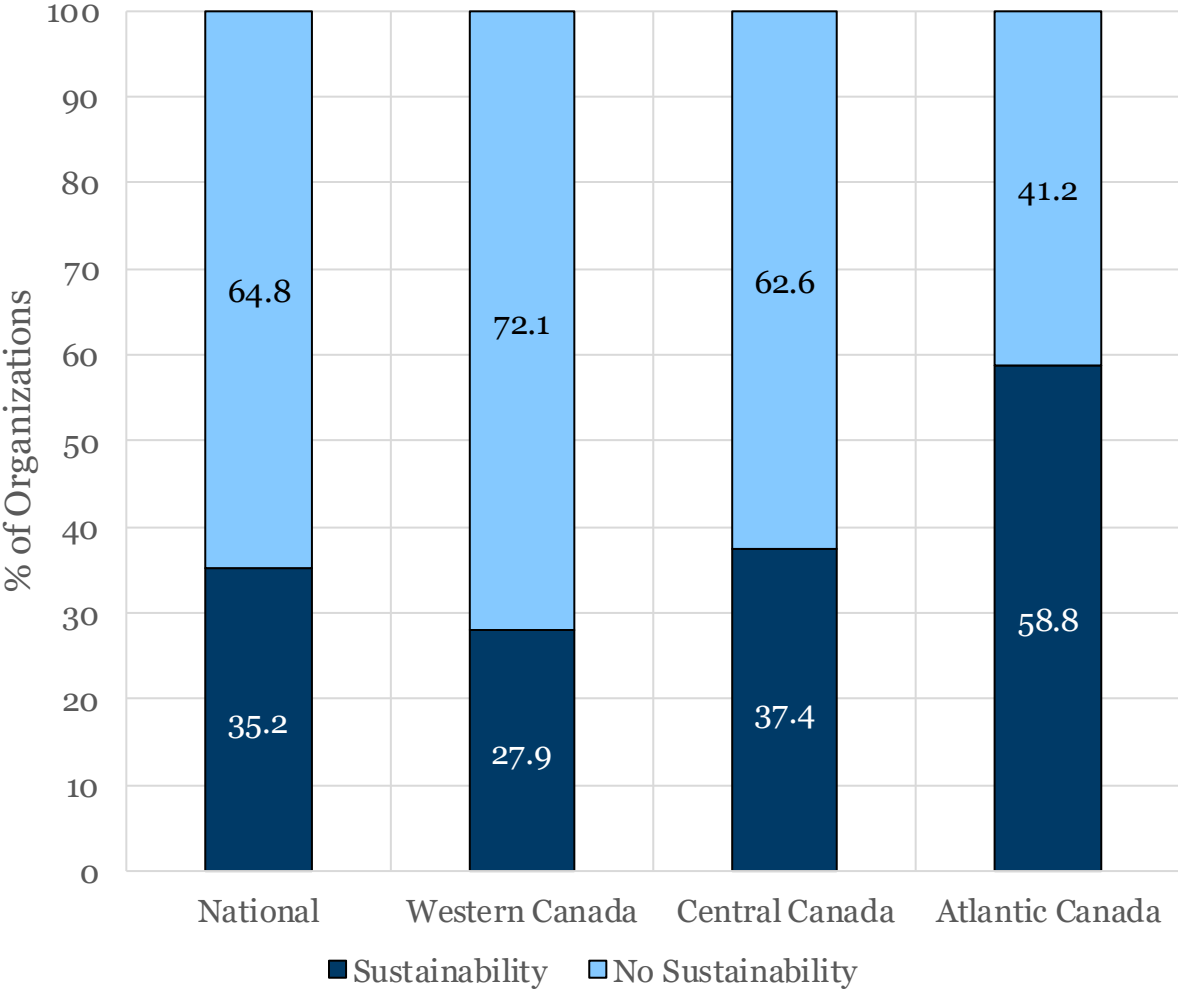


Sustainability Benefits

Sustainability Benefits



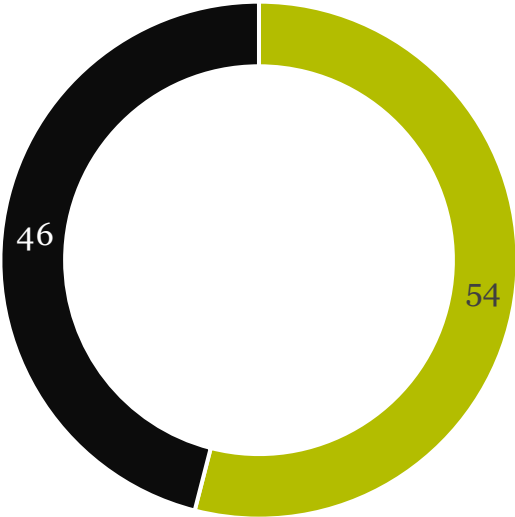
Sustainability Benefits - Geographic Differences



ORGANIZATION STRUCTURE

Gender Diversity & Location

Organizations Reporting Management Team



■ Reporting ■ Not Reporting

Management Team Gender Diversity



■ Women in Leadership ■ Men Only in Leadership

Urban (CMA) Mgmt Team Gender Diversity



Rural Mgmt Team Gender Diversity



Gender Diversity & Organizational Focus

Management Team Gender Diversity



■ Women in Leadership ■ Men Only in Leadership

Precision Agriculture - Mgmt Team Gender Diversity



Other Technologies - Mgmt Team Gender Diversity



Orgs Identifying Sustainability - Mgmt Team Gender Diversity



Orgs Not Identifying Sustainability - Mgmt Team Gender Diversity



Summary & Next Steps

- Characteristics of Canadian Ag-Tech orgs:
 - Majority located in urban centres
 - Diverse application areas and technology types, influenced by location
- Benefits:
 - Subset of firms focus on sustainability, with more coverage among Atlantic Canada orgs
- Organizational structure and sustainability?
 - Women less likely to be in management among orgs in rural areas
 - Precision Ag organization management teams are evenly distributed
- Next Steps: Conduct additional analyses to explore differences

Thank you!

Questions?

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University of Waterloo Disruptive Technologies Website:

<https://uwaterloo.ca/disruptive-technologies-economic-development/>

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