Prairie Agriculture: Preparing for the Future

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Global Temperature (from NOAA)

Temperature Anomaly (Degrees C) compared to 20th Century average

- 1881
- 1906
- 1931
- 1956
- 1981
- 2006

Global Temperature (from NOAA)
Report on climate change shows Canada warming at twice the rate of rest of world

Temperature change RCP2.6 (2081-2100)
Annual

Temperature change RCP8.5 (2081-2100)
Annual

(°C)
Frost Dates (e.g. Arborg Manitoba)

First Fall Frost occurring 3 days later by decade

Last Spring Frost occurring 2 days earlier by decade

K. Pawluk, UManitoba
Weather Impacts are all around us, but climate impacts less clear
Projected Global Temperature Increases (IPCC 5th assessment)
General Prairie Climate 2050 Message

• Weather vs. Climate (IPCC)
• Uncertainty: no change if less than 1 S.D. of current variability
• Annual Temperature; Increase between 1 and 4 °C, likely 2 to 3°C (current S.D. = 1 °C)
• Precipitation: little change?
• Change in Variability and Severe Weather?
“Limiting global warming to 1.5°C would require rapid, far-reaching and unprecedented changes in all aspects of society”

“Limiting warming to 1.5°C is possible within the laws of chemistry and physics but doing so would require unprecedented changes,”
Mitigation and Adaptation

• If we mitigate *globally*, we will need to adapt less

• But *mitigation has an impact*; and we need to adapt to mitigation

• Unfortunately, *actions outside Canada* will still force us to adapt
Continuous Adaptation

• The world is adapting around us
• Standing still means falling behind
• A changing climate is only one consideration; and perhaps it is the easiest one to predict

Red Queen Effect

“… Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!”

Lewis Carroll
Through The Looking-Glass
Dominic Barton Report

Canadian success in capturing sector growth¹
Canadian GDP growth / global GDP growth

Bubble indicates size of Canadian sector
Sector GDP / total GDP

1 Based on historical GDP CAGR data for 2010 - 2015
Human-made chaos disrupted market patterns this year
Trade disputes have added a new layer of unpredictability
Successful Adaptation Tool Kit: People directly engaged in Agriculture and Food

1. Innovation
2. Policy Tools
3. Communication
4. Education
Technology supporting Adaptation

1973 J.I. Case 1270 Tractor

2016 Autonomous Case IH Magnum Tractor
Innovation supporting Adaptation

• Science-based, technology-enabled
• Long-term goals/impacts (local, domestic, international)
  – land manager voice and engagement
  – social values
  – communication

Photo: E. McGeough
Policy supporting Adaptation

- Currently support intensification
- Mitigation as part of adaptation
- Public preparedness and trust requires transparency and monitoring
- Institutional flexibility and resilience in a time of change
Are We Screwed? Geoff Dembicki brings a millennial perspective to climate change

December 5th, 2018
Science First Guest Speaker Series

Jane van Koeverden · CBC · August 29, 2017

Geoff Dembicki looks at what millennials are doing to combat climate change. (Twitter/Bloomsbury USA)
Canadian farm operators: An educational portrait

Highest level of educational attainment, 2016

- 18.4% No certificate, diploma or degree
- 28.7% Secondary school diploma or equivalency certificate
- 14.0% Apprenticeship or other trades certificate
- 21.0% College, CEGEP or other non-university certificate or diploma
- 17.9% University certificate, diploma or degree

Agrologist Education (P.Ag.)

• National Standard (60 ch Agrology with 24 ch Senior level)
• University of Manitoba Faculty of Agricultural and Food Sciences Renewing its Curriculum
• Goal: All students graduating from one of our agrology-related degrees will meet the National Standard
Results from MIA surveys: 135 at last year’s AGM; 197 online survey

**Knowledge:** Technical knowledge, and knowledge of both local and global issues, are important or very important. Knowledge of Indigenous perspectives was less important.

**Skills and Abilities:** All highly valued, including communication, critical thinking, problem solving, time management, and computer skills.

**Personal Attributes:** All personal attributes were important, including professional and ethical behaviour, teamwork, self-confidence, and leadership. Also “fluid” attributes such as respect and empathy were important.
University of Manitoba Faculty of Agricultural and Food Sciences
Undergraduate Degrees in The Food System

- B.Sc. Agriculture (specialties)
- B.Sc. Agroecology (integrative)
- B.Sc. Food Science
- B.Sc. Human Nutritional Sciences

- Natural Resources
- Food and Bioproduct Production
- Food Development and Processing
- Human Health and Nutrition

Business, Economy and Policy

- B.Sc. Agribusiness
An Agrologist will be:

1. **A Scholar**: think critically; solve problems; engage in life-long learning

2. **A Technical Expert**: comprehend knowledge; apply and evaluate knowledge and skills; understand Indigenous knowledge

3. **Socially Accountable**: demonstrate respect, ethics, and equity; understand impact; abide by codes
An Agrologist will be (Part 2):

4. **A Skilled Communicator**: communicate effectively; build consensus; evaluate and select communication modes; demonstrate awareness, responsibility, social and emotional intelligence

5. **A Professional**: demonstrate management skills, professionalism, self-respect, resiliency; take responsibility for one’s own actions; demonstrate and provide leadership; advocate for society and the environment; demonstrate the ability to work in teams; understand professional designations
Agrologist Technical Competencies

• Varies among degrees (Agribusiness, Agriculture, Agroecology)
• Foundational (Economics, Sciences, Communication, Numeracy/Statistics)
• Food and Human Nutrition
• Plant Systems; Animal Systems; Land, Air and Water Resources; Ecological Concepts
• Economic Concepts
• Integrated Systems
Successful Adaptation: Interactions are Critical!

Role of Agrologists

Engage in the Dialogue!
What do you think?

- What will be the most drastic change for Prairie Agriculture in the next 10 years?
- What about in 30 years?