



FACT SHEET 1 –
What is climate
change & how
will it impact
BC agriculture?



photo by Tomas Bercic

What do we mean by “climate change”?

There is growing consensus amongst scientists and governments worldwide that human activity is altering the greenhouse gas levels in the atmosphere and in doing so, impacting global climate patterns.

Greenhouse gases¹ have always “trapped” the heat of the sun within the Earth’s atmosphere; this natural greenhouse effect (caused primarily by water vapour) is estimated to warm the surface of the Earth by 33°C. However, concentrations of greenhouse gases in the atmosphere have increased steadily since the industrial revolution, with rapid increases over the past 30 years.

These additional emissions, generated by human activity, are being linked to higher global average temperatures and to more frequent and extreme weather “events.”

¹ Greenhouse gases include: Carbon dioxide (CO₂), Methane (CH₄), Nitrous oxide (N₂O), Sulphur hexafluoride (SF₆), Hydrofluorocarbons (HFC) and Perfluorocarbons (PFC)

Climate change & government policy

The Intergovernmental Panel on Climate Change (IPCC) was created by the United Nations to develop scientific consensus and to guide policy makers on climate change issues. Since the early 1990s, the IPCC has become increasingly emphatic regarding the linkage between greenhouse gas emissions and changes to global climate.

As a result, many countries are in the process of responding to the challenge of reducing greenhouse gas emissions. Although Canada has acknowledged that it will not achieve the Kyoto reduction targets, it maintains a national inventory for the purpose of reporting to the United Nations. Consistent with its *Greenhouse Gas Reduction Targets Act*, British Columbia is also evolving an inventory of greenhouse gas emissions.

Within BC, a range of policies and regulations are being developed to assist the province in meeting its own targets for greenhouse gas reduction. These are



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ambitious, including the goal to reduce emissions by at least 33% below 2007 levels by 2020.

Agriculture & greenhouse gases

Overall, BC agriculture is a relatively small contributor to greenhouse gas emissions; in 2006 only 4% of greenhouse gas emissions within the BC inventory were attributed to agriculture. The majority of individual agricultural operations in BC have low (and diffuse) enough emissions that they are unlikely to be regulated through pending emission thresholds.

The sources of greenhouse gas emissions attributed to agriculture within the inventory include:

- Enteric fermentation (ruminant digestion)
- Manure management
- Agricultural soils (soil disturbance and fertilizers)
- Cleared range / deforestation

Food processing, energy consumption on farms and transportation associated with food production are currently incorporated into other portions of the inventory. However, all elements of the food system are increasingly subject to public/consumer scrutiny and emissions from sources such as “food miles” are

generally associated with the industry, as are its energy consumption emissions.

There are three greenhouse gases relevant to agricultural activities: Carbon dioxide (CO₂), Methane (CH₄) and Nitrous oxide (N₂O).

The agriculture sector contributes a relatively high proportion of methane and nitrous oxide. Methane has approximately 23 times the greenhouse gas impact of carbon dioxide and is released primarily through livestock digestion and manure. Nitrous oxide has about 310 times the greenhouse effect of carbon dioxide and its main agricultural sources are soil disturbance and fertilizer application. Carbon dioxide itself is primarily released through the burning of fossil fuels for energy and the operation of farm equipment.

Measuring the specific emissions associated with agriculture is complex because of the range of agricultural practices and the variables of the soil, climate and land cover for each farm. Nonetheless, there are clear opportunities for emission reductions in agriculture — many are also associated with long-term cost savings. Agriculture is also in a unique position with its potential to sequester carbon — removing carbon from the atmosphere and fixing it (for the long term) in vegetation and soils. More detail regarding emission mitigation options and opportunities is



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provided in *Fact Sheet 3 – Agriculture & Greenhouse Gas Mitigation*.

Impact on agriculture

Although agriculture is not a large emitter in British Columbia, the industry is likely to be impacted disproportionately by changing weather patterns. Agriculture is extremely vulnerable to even minor shifts in temperature which in turn impact hydrological systems and the health of soils and livestock. While there is potential for an extended growing season and wider range of viable crops in some parts of the province, it is difficult to gauge the accuracy of current climate models in this regard.

Extreme weather events — such as flooding and drought — could lead to serious economic losses for agricultural producers.

The potential for reduced production capacity in other regions of the world means a healthy agriculture industry in BC is increasingly critical to food security.

More information about climate change adaptation and BC agriculture is provided in *Fact Sheet 4 – Agriculture & Climate Change Adaptation*.

Beyond the possible impacts of changing climate, the related shifts in policy and public opinion are certain to affect BC agriculture. While the sector is not likely to be regulated, the industry is increasingly being viewed as crucial to climate change mitigation and adaptation. Over the longer term, agriculture is likely to play a role in a number of areas including renewable energy production and carbon sequestration.

There is mounting pressure on the sector to be able to account for — and reduce — its “carbon footprint.” A number of countries and retailers have initiated carbon labelling and “food miles” have become part of consumer lingo. The BC agri-food industry will wish to consider the best way to respond to these demands to ensure that it is able to retain — and build upon — its strengths in the marketplace.

References & online resources

The United Nations Framework Convention on Climate Change

www.unfccc.int

The Kyoto Protocol

www.unfccc.int/kyoto_protocol/items/2830.php

Intergovernmental Panel on Climate Change

www.ipcc.ch

Agriculture & Climate Change Mitigation
www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter8.pdf

Live Smart BC

www.livesmartbc.ca

The Climate Action Plan
www.livesmartbc.ca/attachments/climateaction_plan_web.pdf

Environment Canada Climate Change

www.ec.gc.ca/cc/

A Summary of Trends:
Canada's 2006 Greenhouse Gas Inventory
www.ec.gc.ca/pdb/ghg/inventory_report/2006/som-sum_eng.cfm

Natural Resources Canada — Climate Change Impacts & Adaptation Department

www.adaptation.nrcan.gc.ca

Reports

Climate Change Impacts & Adaptation: A Canadian Perspective — based on research between 1997 and 2002. The report examines potential impacts of climate change and adaptation options for key sectors.

www.adaptation.nrcan.gc.ca/perspective/index_e.php

From Impacts to Adaptation: Canada in a Changing Climate 2007 — explores the challenges and opportunities presented by climate change and focuses on human and managed systems. The report is broken down by province and the current state of understanding is presented, and key knowledge gaps are identified.

www.adaptation.nrcan.gc.ca/assess/2007/pdf/ch8_e.pdf



Climate Action Initiative

BC AGRICULTURE & FOOD

*climate action resources
for the agricultural & food sector
in British Columbia*

www.BCAGClimateAction.ca

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Canada



The *Climate Action Initiative* is facilitating a proactive approach to climate change issues within the BC agriculture and food sector. By developing climate action resources, the Initiative raises awareness and assists the industry in meeting the challenges, and acting upon the opportunities, presented by climate change. The Initiative is led by an advisory committee made up of BC agriculture producers and food processors.

The *Climate Action Initiative* is a joint undertaking of BC Agriculture Council and the Investment Agriculture Foundation, with funding provided by Agriculture & Agri-Food Canada and the BC Ministry of Agriculture & Lands.

For more information about the *Climate Action Initiative*, please contact Initiative Coordinator, Emily MacNair at 250-356-1666 or Emily@BCAGClimateAction.ca.