

# THE Prairie Climate Resilience PROJECT



## Adapting to Future Weather

*Insights from Alberta Agricultural Producers*

MARCH 2009

Farmers have a long history of adapting to changing weather and turbulent economic conditions. But scientists are telling us that because of increasing concentrations of greenhouse gases (like carbon dioxide) in the atmosphere, we are quite possibly in for a rougher ride compared to what farmers have experienced in the past. This rise in greenhouse gases is spurring a process of climate change that is likely to bring new farm challenges in the near future.

Mean annual temperatures have already been on the rise in Alberta, and experts project the warming trend to continue throughout this century, bringing with it increased evaporation and moisture deficits.<sup>1</sup> Severe droughts are also expected to be more frequent, further undermining farmers' coping efforts.<sup>2</sup>

These projected changes are particularly worrisome for prairie farmers as their livelihoods depend on the land and weather. Questions are being asked about what these changes might mean for agricultural operations. What, if anything, can be done now to help reduce the negative impacts of these changes? And how can these weather-related risks be addressed along with other stresses—such as the rise and fall of commodity prices and input costs; ever-changing government policies; the emergence

of new crops and technologies; the introduction of new trade barriers; and the opening of new markets?

Alberta farmers and ranchers have a long history of developing strategies for coping with, and adapting to, weather-related shocks and stresses—sometimes successfully, sometimes not. This experience and expertise provide a rich source of knowledge that can be drawn upon to prepare for future climate change. By asking farmers what has (and has not) worked in the past, and why, it is possible to identify what can be done now to prepare for the future.

With this perspective, between November 2007 and February 2008, interviews were conducted with 40 agricultural producers and agricultural organizations from the Coaldale and Foremost regions of southern Alberta. These interviews were conducted as part of a project led by the Winnipeg-based International Institute for Sustainable Development and conducted by Times Two Consulting of Calgary. What these producers and organizations said provides insight into what can be done now to help cope and adapt to future climate variability and change.

<sup>1</sup> Environmental Research and Studies Centre, University of Alberta: [www.ualberta.ca/ERSC/water/climate/impacts2.htm](http://www.ualberta.ca/ERSC/water/climate/impacts2.htm)

<sup>2</sup> Government of Canada: "From Impacts to Adaptation: Canada in a Changing Climate", [http://adaptation.nrcan.gc.ca/assess/2007/pdf/ch7\\_e.pdf](http://adaptation.nrcan.gc.ca/assess/2007/pdf/ch7_e.pdf)

## Weather-related Shocks and Stresses

With regard to weather-related shocks and stresses experienced by producers in the Coaldale and Foremost regions, conditions were, figuratively, all over the map. In 2000 and 2001 producers were faced with drought conditions. In 2002 and 2005, heavy rainfall and flooding were the operating environment. Then in 2007, extreme heat and dryness were reported, particularly in July.

***“Extreme weather events, if anything, made us more aware of what was going on and probably made us more business-like in putting a plan together to address those critical situations when they appeared.”***

## Coping and Adaptation Strategies

Crop insurance is commonly used by producers in both regions to cope with drought over the short term, while minimal and reduced tillage techniques; crop diversification; crop rotation; and the selection of crops that were suited better to drought conditions, are some of the common longer-term strategies. Unique to Coaldale are irrigation-related strategies and the ability to divert water; purchase more water rights; and use efficient irrigation technology. In the Foremost region, producers could do little about obtaining more water, so over the short term, they make efforts to reduce their input costs and become more financially sound. Longer-term strategies that were identified included participation in market research groups; the use of technology that minimized soil disturbance and moisture loss; shelterbelts; community water pipelines; and the sharing of local knowledge among producers.

***One farmer said that “we’re in an area where you know there are going to be cropping disasters, you know there are going to be deficits in moisture. We try to manage our farm on that basis because they are not a surprise by any stretch of the imagination.”***

In coping with heavy rains and flooding, producers in both regions make use of crop insurance to cope over the short term and incorporate longer-term adaptation strategies such as crop rotation and shifted seeding and harvest times. In Coaldale, producers have pumped water off the land; dug ditches and drainage systems; bought more silage for their cattle; reploughed their fields; and put sawdust in between the rows of crops in U-pick operations. Longer-term adaptations unique to this region include building more permanent drainage systems including water pumps; reduced tillage practices; and the selection of crops suited to wet conditions. In Foremost, some producers feel that they can’t do anything to respond to wet conditions over the short term, and have simply reduced their movement and disturbance on the land. Longer-term adaptations, such as crop rotation of less expensive crops through wet areas and changing seeding times, are similar to the techniques employed in Coaldale.



# What Helped? What Hindered?

## What Helped Coping and Adaptation?

Respondents from Coaldale and Foremost named many common factors that aided them in responding to weather and non-weather stresses. Among these were:

- **Research and learning:** This includes individual learning (taking courses, expertise gained over time or from family members, online research) and information received from external organizations (i.e., Lethbridge Research Station, Alberta Agriculture, Irrigation District offices, Reduced Tillage Linkages, etc.);
- **Geographic spread of operations:** Being spread out means that different parts of the operation will get hit with different weather patterns;
- **Government programs:** Crop insurance and the Irrigation Rehabilitation Program were given as examples;
- **Organic practices:** These farming methods were seen as helpful for all weather extremes;

- **Networking:** Sharing information with other farmers through formal and informal networks; and
- **Adaptation to the land:** Learning what works well on the land and what doesn't.

Aiding factors unique to Coaldale respondents included many that are related to irrigation, such as the water rationing agreement; calculation of water rations during the 2001 drought year; implementing more efficient irrigation technologies; and receiving help from the Saint Mary's Irrigation District with drainage during the flood. Other factors mentioned by one or two respondents included: growing for niche markets; growing in a greenhouse; using diverse crop rotation; using reduced tillage or no-till practices; and growing their own silage. Aiding factors reported only by Foremost participants included: using personal savings; participating in management groups; and having more machinery to increase efficiency.

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## What Helped? What Hindered? *continued from page 3*

### **What Hindered Coping and Adaptation**

Hindering factors cited by Coaldale participants included the following: the timing of the weather extreme (i.e., whether the rain came after irrigation or during harvest time); sunk and damaged machinery (because of flooding); a water pump shortage; and the contamination of the water supply by livestock operation run-off. An irrigation-related factor that hindered coping in Coaldale was that water rights started to be treated as a commodity and some people were using them to make a profit. Respondents from Foremost

identified a lack of technical support at the nearest research centre; a restriction on the use of certain fertilizers; and a threat of bankruptcy as hindering factors.

Other hindering factors not necessarily relating to weather-related stresses were also mentioned by producers. These included: the increased costs of doing business (energy, grain, land and labour prices were all cited); the booming Alberta economy, at the time, and the related labour shortage; insufficient or poorly run government programs; and increased insect and disease pressure.



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