

THE Prairie Climate Resilience PROJECT



Adapting to Future Weather

Insights from Saskatchewan 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 (GHGs) in the atmosphere, we are quite possibly in for a rougher ride than ever before. This rise in GHGs is spurring a process of climate change that will likely pose unique challenges for farmers.

Temperatures have already risen in Saskatchewan, and are projected to rise by 3–6°C before the end of this century. Accompanying changes in precipitation are expected to lead to an overall drying trend as droughts become longer and more intense, lake and river levels decline, and evaporation increases. These changes will not take place smoothly; there is expected to be greater variability in our climate and a greater number of extreme weather events such as severe winds, hail, floods and snow storms.^{1, 2}

These projected changes are particularly worrisome for prairie farmers as their economic livelihood depends 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?

Saskatchewan farmers 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 can help farmers prepare for future climate change impacts.

From this perspective, in 2007, the Natural Resources Institute at the University of Manitoba and the International Institute for Sustainable Development interviewed 38 farmers and farming organizations around the rural municipalities (RMs) of Pense and Redburn west of Regina and near Benson and Estevan southeast of Regina.

What these farmers and organizations said provides insights into what can be done now to help cope and adapt to future climate variability and change.

¹ Climate Change Saskatchewan. Expected impacts – what can be done? www.climatechangesask.ca/html/learn_more/Impact_Adaptation/Impacts_expected_doing/index.cfm.

² Henderson, Norm. 2008. Climate Change Impacts in Saskatchewan. Regina EcoLiving Web site. www.reginaecoliving.ca/



Weather-related Shocks and Stresses

Based on research conducted by Kent Pearce, Master's Degree candidate with the Natural Resources Institute, University of Manitoba

Southern Saskatchewan has seen considerable climate variability since the mid-1990s. The last decade has brought several of the warmest winters on record; droughts in 2001 and 2002 that cost the province billions of dollars in damages; and record-breaking rainfall events (such as in 2000, when 330 mm of rain fell in Vanguard in an eight-hour period).

In the rural municipalities (RMs) of Pense and Redburn, west of Regina, farmers reported that the most significant weather-related stresses that they had experienced in the previous 10 years were early frost, drought, excess moisture or flooding, and hailstorms. Farmers in the southeastern RMs of Benson and Estevan also identified early frost and excess moisture and flooding as concerns, but had been less affected by drought. Overall, farmers from the southeast felt that the weather they had experienced in the previous decade had not been too bad compared to other periods of time.

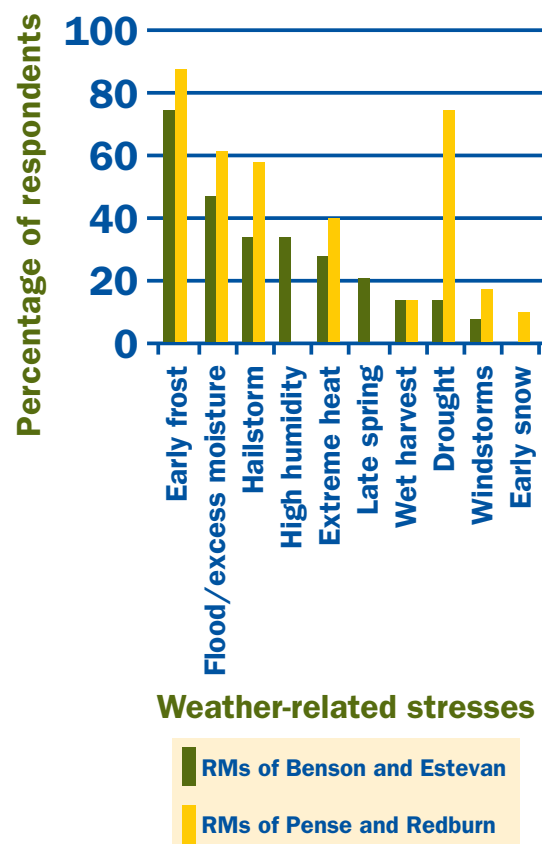
The adverse weather events experienced since the mid-1990s have caused minor to complete crop loss, lower yields per acre and poorer quality crops. Other impacts include damaged equipment; harvesting difficulties; delayed seeding; washing out of local roads; increased pest activity; and, particularly in the southeastern RMs, greater outbreak of crop diseases.

“I believe 100% that climate change is real and occurring. It won't be the end of farming, but we have to adapt and change. We have to begin looking at more drought-tolerant crops and crops that can be harvested in less than ideal conditions.”

All of these impacts contribute to income losses. The degree of loss is influenced by the type of farm in question. In Pense and Redburn, for example, farms are larger and are dominated by grains, oil seeds and pulse crops, reflecting the region's topography and soil types. Larger farms enable farmers to spread weather-related risks over a larger area; localized weather events like hail, frost or flooding can affect one field while leaving a distant field unharmed.

In contrast, the topography and vegetation found in southeastern Saskatchewan have encouraged more mixed farming. Here, farmers are better able to offset losses from one type of crop with income from livestock operations or another crop—one that is less sensitive a certain weather hazard or has a different seeding and harvesting schedule.

FIGURE 1: Commonly identified weather-related stresses



Coping Strategies

The strategies used by Saskatchewan farmers to cope with weather stresses are diverse and typically reflect the farm type.

The main strategies used by farmers in both of the regions surveyed were:

- **Insurance:** the vast majority of the farmers purchased Saskatchewan Crop Insurance or hail insurance, to help offset losses caused by specific weather events.
- **Take the loss:** often there is no specific action (other than purchase insurance) that can be taken to overcome the damage caused by an extreme weather event.
- **Zero or minimum till:** while initially adopted for economic reasons, it can help retain moisture and prevent widespread erosion, reducing exposure to changes in precipitation.
- **Early harvest.**

Specific, regional strategies are also employed. In southeastern Saskatchewan, farmers are more likely to sell or use damaged grain as livestock feed; apply various on-farm management practices; increase the use of spraying; change marketing practices; and engage in holistic ranching. In the RMs of Pense and Redburn, strategies include the use of multiple field locations; delayed harvests; seeding for a short cropping season; and storage of grain for multiple years.

“Zero-till helps me to capture snow in the winter and maintain soil moisture in the summer. In a hot dry summer it’s your saved moisture that keeps your crop growing.”

Of the strategies identified, only a few involve a long-term change in practice. These include the adoption of minimum or zero-till; holistic ranching; changing marketing practices; and having multiple field locations. The emphasis on short-term strategies likely reflects the higher costs associated with taking long-term adaptation measures (like buying new technologies, investing in infrastructure and making major landscape changes). It also suggests that the uncertainty about the nature of future weather events makes it difficult to commit to investing in longer-term measures, particularly when economic margins are already tight.

“The weather has definitely been more variable in the past 10 years.”



What Helped?

A number of natural, financial and infrastructural resources were identified by farmers as having been helpful in their efforts to cope and adapt to weather stresses. The most common resource identified was, not surprisingly, the annual sale of crops or livestock that generates the income needed for other critical resources like savings, liquid assets and farm implements. Such comments reflect the importance of financial security in coping and adapting to increasingly variable weather. Insurance, along with transfers from government, were also identified as resources relied upon in times of trouble, but typically not ones around which farm management strategies are designed. The availability of critical natural resources such as good quality soil and accessible water are also depended upon to help cope with adverse weather.

A challenge, however, is that the critical resources relied upon to overcome adverse weather conditions—the crops, livestock, water and soils—are also exposed to the same weather events. This situation illustrates the current critical nature of the exposure of Saskatchewan farmers to future extreme and variable weather events.



“Zero-till has been the most significant change that I’ve seen in my time farming. Since I’ve changed, I’ve been very happy with it. My production went up and my time in the field went down.”

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Funders:

- Climate Change Impacts and Adaptation Division, Natural Resources Canada
- International Development Research Centre

Acknowledgement:

This primer is based on field research conducted by Kent Pearce, Master’s Degree candidate with the Natural Resources Institute, University of Manitoba. Mr. Pearce’s research was supervised by Dr. Fikret Berkes.