

THE Prairie Climate Resilience PROJECT



Adapting to Future Weather

Insights from Manitoba 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 in the atmosphere, we are quite possibly in for a rougher ride than what farmers have experienced in the past. This rise in greenhouse gases is spurring a process of climate change that will likely pose unique challenges for farmers.

In Manitoba, scientists are expecting average temperatures to become warmer over the next few decades, particularly in the winter. Spring is expected to arrive earlier and be wetter, and to be followed by drier summers. Of perhaps greater concern is the expected increase in weather variability—more dramatic swings from excessive rain to drought—and for more frequent extreme weather events like hailstorms, tornadoes and intense rainstorms.

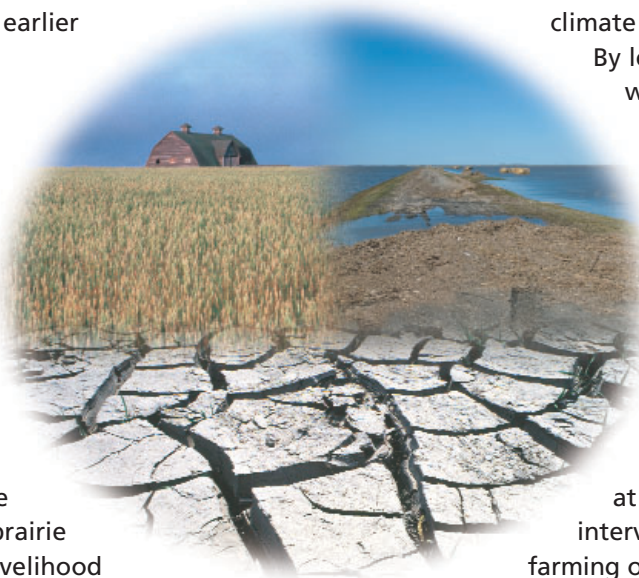
These projected changes are particularly worrisome for prairie farmers as their economic livelihood depends on the land and weather. Questions are being asked about what these changes might mean for agricultural operations? What, if anything, can be done now to help reduce the negative impacts of these 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?

Manitoba 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 provide a rich source of knowledge that can be drawn upon to prepare for future climate change and its impacts.

By learning from farmers about what has (and has not) worked in the past, it is possible to identify what can be done now to prepare for the future.

From this perspective, in 2004–05, the Winnipeg-based International Institute for Sustainable Development (IISD) and the Natural Resources Institute at the University of Manitoba interviewed 80 farmers and farming organizations in the southwest corner of Manitoba (north and southwest of Brandon). 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.



Weather-related Shocks and Stresses

by Peter Myers, Graduate Student, Natural Resources Institute, University of Manitoba

Between 1999 and 2005, the areas to the north and southwest of Brandon experienced significant changes in moisture conditions—from the droughts of 2001 and 2002, to the chilly summer of 2004, and through to the summer of 2005, in which the province experienced the worst summer flooding on record.

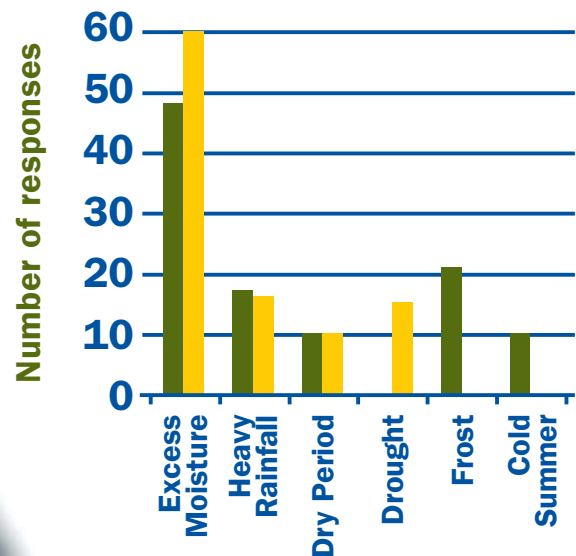
When farmers were asked about the weather-related stresses that had caused them most recent concern, excess moisture was mentioned most often. In the Riding Mountain area north of Brandon, farmers noted that these conditions had led to late or no sowing of crops and to an increase in the number of weeds. In Manitoba’s southwest corner, more weeds and unsown acres also were concerns, along with lost yields. Heavy rainfall—leading to unsown acres, late sowing, flooding out of acres, late harvests, lost yields and poorer quality crops—was also a concern in both locations.

“The 1999 moisture was the most shocking year. Talking to oldtimers, they’d never seen a year like this—there was always a two-week window for both seeding and harvest—we got neither.”

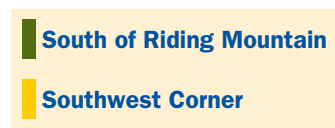
Along with these similarities, the two regions also reported markedly different weather stresses and shocks. In the southwest, drought and dry periods were of greater concern, causing lost yields, feed shortages and insect problems. Around Riding Mountain, dryness was a concern but of less importance than frost and cold summer temperatures that caused lost yields, loss of grade, and more immature and diseased crops.

These impacts added to other concerns experienced by Manitoba farmers during this time, including the BSE crisis (“mad cow disease”), low commodity prices and high input costs. The loss of yields due to weather events compounded the stress and tight economic margins caused by these problems. Farmers noted that these non-weather-related stresses increased the vulnerability of their operations to future weather events.

FIGURE 1: Commonly identified weather-related stresses



Weather-related stresses



Coping and Adaptation Strategies

Farmers used a number of different strategies and actions to cope with the weather-related shocks and stresses they experienced between 1999 and 2005. The most common actions taken were to:

- **Employ a standard farm practice**, particularly maintaining existing drainage systems and cultivating the soil, but also burning stubble, applying herbicides and allowing fields to stand idle for a growing season.
- **Alter a farm cycle** for no longer than one season, such as by putting cattle on pasture land earlier than planned; feeding cattle grain later into the spring; sowing crop varieties that have a shorter growing season; and overwintering cattle using feeding formulas to reduce hay consumption.
- **Access outside help from within the agricultural sector**, such as by hiring local help, importing local feed or using a local abattoir.
- **Wait it out.**
- **Work longer or do extra work.**
- **Make crop insurance claims.**
- **Work with the weather**, such as by harvesting wetlands for feed and creating silage from failed crops.
- **Use technological advances.**
- **Increase buffering capacity**, such as by cropping lands distributed over a wide area, stockpiling hay and rotating crops.
- **Reduce seeding or other inputs.**
- **Alter a farm cycle for more than one season.**
- **Participate in local associations and support networks.**
- **Improve marketing strategies.**
- **Reduce spending.**
- **Implement reduced tillage.**

Most of these actions involved short-term modifications of existing farm practices. Only a few actions, such as increasing buffering capacity, taking advantage of advances in technology and altering a farm cycle for a season or more, are strategies that could help farmers adapt to weather risks over the long-term. The responses received from farmers also indicated that the coping strategies they used were influenced by other stresses (like low commodity prices) and the circumstances of each farm (e.g., type of crop grown or livestock operation, local topography and soil conditions and degree of weather-related stress).

The emphasis on short-term coping strategies reflects the higher financial and labour 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 associated with how permanent weather-related changes might be—were the excessive moisture conditions the start of a long-term trend?—makes it difficult to commit to investing in longer-term measures, particularly at a time when economic margins are already tight.



“We planted crops which handle moisture better—less flax, more wheat and barley on the drier land.”

What Helped? What Hindered?

Farmers identified a number of factors that either helped or hindered their strategies for coping and adapting to different weather conditions. Of particular assistance to farmers in the southwest corner of Manitoba was networking among farmers and organizations, and maintaining operational flexibility. In the more northerly farms around Riding Mountain, the availability of technologies, recognition of the need to outsource activities and having good neighbours were found to be particularly helpful in taking actions that responded to changes in weather conditions. Farmers also noted that past experience enabled them to cope better with weather-related stresses—that they were better able to respond to drought as they were more familiar with its impacts than to excess moisture, which was a relatively unknown phenomenon.

Barriers to taking desired actions were also noted. These included regulations and the absence of political will, which hampered the employment of standard farm practices, as well as the additional expense associated with taking these actions. A further concern was problems with neighbours due to, for example, flood-outs caused by the drainage of upstream farms.

“Dealing with dryness is not a surprise—weather problems are dealt with through my built-up experience, while drawing on the wealth of experience from older farmers and neighbours in the area. They have a far greater ability to adapt.”

Aids to coping:

- *organization among farmers;*
- *participate in an organization;*
- *flexibility of operation;*
- *good neighbours;*
- *market options;*
- *buffer capacity;*
- *knowledge, experience and attitude;*
- *recognize need to outsource;*
- *available technology;*
- *no hesitation.*

Impediments to coping:

- *political will and regulations;*
- *additional expenses;*
- *problem with neighbours;*
- *inexperience with stress;*
- *unpredictability;*
- *poor quality commodity;*
- *difficult market;*
- *increased stress level;*
- *increased workload;*
- *short growing season;*
- *drainage regulations.*

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