Canadian Prairies Case Study: Changing farming methods to reduce SDS

The Dirty 30s.

The 1930s are referred to as the Dirty 30s in the Canadian Prairies. Drought and farming methods contributed to dust storms while economic and social conditions led to outmigration and, in some cases, the abandonment of farms. None the less, farming, particularly wheat but also other field crops, was and remains, a significant part of the economies in Alberta Saskatchewan and Manitoba.

Following the Dirty 30s, studies were done on the causes of the dust storms and changes in farming proposed. But farming in the province remained largely based on the same approach used in the 1930s and before.

The Impact of Summer Fallow

This approach, referred to as Summer Fallow, involved plowing fields in the Spring and replowing to control vegetation growth, but with planting not taking place until the succeeding Spring. This technique, discovered mid-19th century, was found to increase soil moisture and improve yields when crops were planted.

Unfortunately, Summer Fallow also meant that drought conditions led to the drying of fields but without a layer of vegetation to minimize wind erosion. As a result, the type of soil common in the main farming areas of the Canadian Prairies could easily be picked up by winds and contribute to severe dust storms.

That Summer Fallow could be contributing to wind erosion, and, in the extreme, dust storms, was recognized in some quarters. But the tradition of using the method was strong, with a view that a farmer who did not do Summer Fallow was not farming properly.

Conservation Tillage and Reducing Wind Erosion

At the same time, on-farm efforts were taking place to improve farming methods. These efforts included conservation tillage. This technique involves injecting seed, fertilizer and herbicide into the ground with minimal or no significant disturbance of the soil when planting or during crop growth.

Conservation Planter and Tractor, Saskatchewan, Canada. Source: https://www.youtube.com/watch?v=ukK1Xruk5kM

Some farmers experimented with conservation tillage, but the technique did not take off until the price of fuel increased and the cost of herbicide dropped, making conservation tillage more economical than other methods. In contrast to Summer Fallow, conservation tillage protects the soil during dry periods and leaves plant remnants on fields, increasing protection from wind erosion.

Conservation tillage is likely not the only reason dust storms are reported to have decreased in the Canadian Prairies. Yet, analysis of weather conditions between 1961 and 2006 indicates a decrease in dust events from 1990 onwards, as conservation tillage increased. This increase has also impacted the climate in the Prairies, including a reduction in average temperatures and an increase in precipitation. In considering ways to manage SDS sources, the significance of

economic factors, in the Canadian Prairies case the relative cost of fuel and herbicides, in changing farming methods should not be ignored.

Source materials:

Awada, L., Lindwall, C. W., and Sonntag, B. (2014). The development and adoption of conservation tillage systems on the Canadian Prairies. **International Soil and Water Conservation Research**, Vol. 2, No. 1, pp. 47-65.

Fox, T., Barchyn, T., and Hugenholtz, C. (2012). Successes of soil conservation in the Canadian Prairies highlighted by a historical decline in blowing dust. **Environmental Research Letters** 7.

Gameda, S., Qian, B., Campbell, C.A., and Desjardins, R.L. (2007). Climatic trends associated with summerfallow in the Canadian Prairies. **Agricultural and Forest Meteorology**, 142:2-4.

Henry, L. (2024). No-Till's Quite Revolution in Saskatchewan. **No-Till Farmer**, https://www.no-tillfarmer.com/articles/13416-no-tills-quiet-revolution-in-saskatchewan, accessed 26 October 2024.

Mann, J, and Horr, R. (2023). Zero-till revitalized farm sector. **The Western Producer**, https://www.producer.com/opinion/zero-till-revitalized-farm-sector/, accessed 26 October 2024.

Thomas A Fox, T., Barchyn, T. and Hugenholtz, C. (2012). Successes of soil conservation in the Canadian Prairies highlighted by a historical decline in blowing dust. **Environmental Research Letters.**

Wheaton, E. (1992). Prairie Dust Storms – A Neglected Hazard. **Natural Hazards**, Vol 5.

Wheaton, E. and Chakravarti, A. (1990). Dust Storms in the Canadian Prairies. **International Journal of Climatology**, Vol 10.

#