FACT SHEET:

Structural Collapse

BACKGROUND

Research for this project was conducted by Rochelle Thompson, University of Guelph.

Sometimes, farm buildings such as barns, sheds, shelters, and storage buildings collapse. This can be caused by fire, extreme wind, truss failures under heavy snow, or cumulative damage.

Structural collapse can have serious consequences that impact the wellbeing of farmers and farm families. In addition to the loss of the building(s), structural collapse can result in the loss of equipment and livestock, business interruption, and extreme stress (Ontario, 2024).

Structural collapse may also introduce additional hazards to farmers and livestock, including downed power lines and fuel leaks.

This fact sheet has been designed to complement the Canadian Centre for Agricultural Wellbeing's (CCAW) Response Toolkit for Agricultural Crises.

Find the Toolkit and other crisis-specific fact sheets on the CCAW website.

CANADIAN CENTRE FOR AGRICULTURAL WELLBEING

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FIRE

On farms, fires can progress quickly due to the amount of fuel present (such as bedding, manure, feed) and the large open areas of barns – barn fires may be fully developed within six minutes of ignition (Animal Health Emergency Management Project, 2022). As a result, they often result in total loss of structure (Wheatland County, 2020).

Over time, farms have grown larger and farm buildings have increased in size and value. When they catch fire, they are more challenging to extinguish and result in greater losses (Ontario, 2024).

In Canada, fewer barn fires are occurring with greater associated financial losses. For example, the Office of the Fire Marshal and Emergency Management reported 152 barn fires in Ontario with an estimated $54 million in losses in 2021, compared to 172 barn fires with $47.3 million in losses in 2019 (Van de Vegte et al., 2019; Ontario Federation of Agriculture, 2024).

Electrical system faults consistently are the leading cause of preventable barn fires (Ontario, 2024).

WIND

Building code only requires farm buildings to withstand two-thirds of the wind load that most other buildings are required to withstand. As a result, farm buildings sustain wind damage more frequently than other structures (Kornay, 2024).

Farm buildings are especially susceptible to wind damage and/or collapse due to their long and narrow design, open floorplans, and lightweight building materials, as well as their location in large open spaces (Kornay, 2024).

Damage may also accumulate over time and result in the collapse of farm buildings under high wind conditions.

SNOW

Barns and other farm buildings are commonly built with low slope angle roofs.

As a result, they are particularly susceptible to damage and/or collapse following heavy snowfall or accumulated snow loads (Canadian Agricultural Safety Association/Canadian Pork Council, 2022).

Impacts on Farms and Farmers

Structural collapse can have wide-ranging impacts on farms across Canada.

Specific impacts of structural collapse as it relates to farmer wellbeing and livelihoods are described below.

Euthanasia and Loss of Animals

Following a fire or structural collapse, farmers must assess the health of surviving livestock. In the case of structure fires, many livestock may die from smoke inhalation or heat exposure rather than burning. This can also include animals that were nearby or in adjacent barns (Poultry Industry Council Emergency Response, 2024; Risk Reduction Strategies Victoria, BC, 2018).

A report by Humane Society International/Canada (2020) estimated 740,000 livestock deaths from barn fires in Canada between 2015 and 2019.

In some cases, livestock otherwise unaffected by the event may not be able to be moved to another location or sent to market, in which case, depopulation may be required (Poultry Industry Council Emergency Response, 2024).

High levels of mortality will very likely take a heavy toll of the mental health of farmers and their staff, particularly around disposing of deadstock. Farmers aim to raise healthy animals and will go to great lengths to protect them.

Animal Rights Activists and Media

In the event of a structural collapse, farmers may be concerned about the public interfering with the recovery response, especially if the building is close to a road, or in a busy area. Animal rights activists may arrive at emergency scenes to protest (Ontario Pork, 2023).

Being targeted by animal rights activists has been associated with negative and long-term impacts on farmer and farm families' wellbeing (Ceccato et al., 2024).

Media may pressure farmers to comment on emergency scenes (Ontario Pork, 2023.) Ontario Pork (2023) advises that someone outside of the farm family be appointed as the point of contact between the farm and police, media, and activists to reduce stress on the farmers.

Financial Impacts

In the interviews conducted by the University of Guelph with farmers and individuals working in various aspects of the agricultural industry, interviewees explained that often, insurance claims for structural collapse or loss to fire may be denied or only partially cover the cost of rebuilding.

Farmers may incur additional costs following structural collapse, such as paying others to raise and care for their livestock and loss of production while farm buildings are being re-built. Some farmers have also had difficulty finding a barn builder on short notice.

Interviewees urged others to ensure they have appropriate insurance prior to structural collapse. Many farmers found it challenging to navigate insurance claims following the loss of their barns, resulting in frustration that negatively impacted their wellbeing.

Decision Making

In the interviews conducted by the University of Guelph, interviewees described how re-building farm buildings following structural collapse requires a potentially overwhelming amount decision making at once.

Farmers will be faced with many decisions about barn and equipment upgrades, which may be difficult for those who do not have long-term plans in place.

REFERENCES

Animal Health Emergency Management Project (2022). Emergency response procedures: Non-disease related emergencies. https://animalhealth.ca/wp-content/uploads/AHEM-Non-Disease-Related-Emergency-Response.pdf

Canadian Agricultural Safety Association / Canadian Pork Council (2022) Check your snow loads (Infographic). https://casa-acsa.ca/en/safetyshop-library/check-your-snow-loads/#:~:text=Due%20to%20the%20low%20slope,collapses%20due%20to%20snow%20loads.

Ceccato, V., Abraham, J., Alwall Svennefelt, C., Göransson, E., & Lundqvist, P. (2024). Impacts and coping mechanisms of farmers as victims by animal rights activism in Sweden. International Journal of Comparative and Applied Criminal Justice, 48(1), 29-52.

Humane Society International/Canada (2020). Untold suffering: The tragic impact of barn fires on animals. A five-year review of barn fires in Canada. https://www.hsi.org/wp-content/uploads/assets/pdfs/reports/2020/200310-HSI-Canada-Barn-Fire-Report-Final.pdf

Korany, Y. (2024, December 16). Why some farm buildings create more insurance loss. Canadian Underwriter. https://www.canadianunderwriter.ca/insurance/why-some-farm-buildings-create-more-insurance-losses-1004253994/#:~:text=Ample%20evidence%20shows%20farm%20buildings,lower%20human%20occupancy%20reduces%20risk.

REFERENCES

Ontario (2024, March 7). Barn Fires in Ontario. https://www.ontario.ca/page/barn-fires-ontario

Ontario Federation of Agriculture (2024, March 13). Ontario farmers, fire chiefs work together on fire prevention. https://ofa.on.ca/newsroom/ontario-farmers-fire-chiefs-work-together-on-fire-prevention/#:~:text=According%20to%20the%20latest%20statistics,of%20just%20over%20%2454%20million.

Ontario Pork (2023) On-farm emergency response planning guide (Third Ed.) https://www.ontariopork.on.ca/Portals/0/52682%20OntPorkEmergMan_2023_Update_CompleteBinder%20digital%20edition%20KB%20fillable.pdf

Poultry Industry Council Emergency Response (2024). Chapter 3: Man made and natural disasters. Poultry Farm Emergency Planning Resource. pp. 62-68. https://emergency.poultryindustrycouncil.ca/emergency-planning/man-made-and-natural-disasters/man-made-and-natural-disasters-an-introduction

Risk Reduction Strategies Victoria, BC (2018). Emergency Management Guide for BC Beef Producers. https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/farm-management/emergency-management/beef_emergency_management_guide.pdf

Van de Vegte, J., Ward, D., & Beadle, S. (2021). Electrical systems in barns. Factsheet #21-041. Ontario Ministry of Agriculture, Food and Rural Affairs. https://www.ontario.ca/page/electrical-systems-barns#:~:text=and%20insurance%20premiums.-,Barn%20fire%20trends,per%20year%2C%202009%20%E2%80%932019.&text=Figure%202.,per%20year%2C%202009%20to%202019.&text=Considering%20the%20significant%20personal%20and,at%20every%20farm%20in%20Ontario.

Wheatland County. (2020). Livestock disaster preparedness project – Barn fires. https://wheatlandcounty.ca/wp-content/uploads/2020/05/LDP-Disaster-Response-Barn-Fires.pdf