Canadian Agriculture Injury Reporting

Agriculture-related Fatalities in Canada

1990 – 2020

CASA | ACSA

Canadian Agricultural Injury Reporting
Surveillance des blessures agricoles au Canada

FUNDING AND SUPPORT

Canadian Agricultural Injury Reporting (CAIR) is supported financially by the Canadian Agricultural Safety Association (CASA). CASA is funded in part through the Canadian Agricultural Partnership, a federal, provincial and territorial initiative and receives additional support from the agricultural and corporate sectors.

Thank you to all individuals and agencies that have contributed to CAIR and the preparation of this report.

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ISBN: 978-1-928063-02-5

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CHAPTER 1: INTRODUCTION

1.1 GENERAL INTRODUCTION

The Canadian Agricultural Injury Reporting (CAIR), formerly known as the Canadian Agriculture Injury Surveillance Program (CAISP), was established in 1995 in response to the need for better information about fatal and hospitalized agriculture-related injuries in Canada. CAIR is a national program with collaborators from across Canada. Agriculture-related Fatalities in Canada examines Canadian agriculture-related fatality data for the 10-year period between 2011 to 2020. This report includes trends over a 31-year time period (1990 to 2020) as well as an in-depth analysis of mechanisms of injury over a 10-year time period from 2011 to 2020.

The reported agriculture-related fatality data is for persons who were part of the Canadian farm population, those who were temporary foreign workers under the seasonal agriculture workers program from Citizenship & Immigration Canada, or those who were at risk for agriculture-related injuries in Canada from 2011 to 2020. From 2011 to 2020, there were 624 agriculture-related fatalities in Canada; an average of 62 per year. Over the 10-year surveillance period, the average fatality rate per 100,000 farm population, per year, was 10.7 fatalities.

Following this introduction, there is a description of the methods used by CAIR. Agriculture-related fatalities in Canada are then described in two overview chapters.

1.2 HISTORY OF AGRICULTURE-RELATED INJURY SURVEILLANCE IN CANADA

Agriculture-related injuries have been recognized as an important rural health issue since the 1960s when the problem was first recognized in the medical literature. At that time, some provincial groups began to monitor agriculture-related injuries, but only since 1998 have substantial national resources been committed to the study of agriculture-related injuries.

When compared with other Canadian industrial sectors, agriculture is a dangerous occupation. Agriculture ranks as the fourth most hazardous industry in Canada with respect to rates of fatal injury. In terms of absolute numbers of fatalities, there is no more dangerous occupation.[1] Economic costs associated with agriculture-related injuries are also substantial. In 2004, agriculture-related injuries in Canada cost $465 million dollars. Unintentional injuries accounted for the majority of costs, 80% of all agriculture-related injury costs ($374 million).[2]

Until the establishment of CAIR, Canadian data on agriculture-related injuries were limited. This surveillance program has filled an important void in providing national evidence of agriculture-related injury occurrence that can be used in developing effective and targeted injury prevention strategies. CAIR data has been used by various groups internationally, including Australia, Brazil, Hong Kong, India, Ireland, Netherlands, New Zealand, the United Kingdom, and the United States. CAIR has been referenced in a variety of inventories and compendiums including guides to occupational and environmental health and safety,

casebooks, and inventories published by the Public Health Agency of Canada (PHAC). In terms of policy, CAIR has been used as a reference source for agriculture-related injuries at international, national, provincial, and regional levels. Information gathered indicates that the program's data has contributed to informing, influencing, and enacting policy development at both federal and provincial levels. Evidence of strategic planning influences at provincial and organizational levels is also apparent, and contributions can be linked to: child safety guidelines,[3] child labour laws,[4] occupational health and safety guidelines,[5] engineering standards,[6] injury reduction, and health promotion strategies. At an international level, the Government of Canada has cited CAIR reports in its 2003 submission to the United Nations Convention on the Rights of the Child and identified CAIR as playing an important role in influencing children's rights in Canada.[7] CAIR has also been identified as a tool for awareness-raising, skill building, and knowledge development through conference presentations, teleconferences, lectures, course materials, social marketing campaigns, and resource materials. From a research perspective, 132 articles in 56 journals reaching a very wide range of disciplines were related to CAIR.

1.3 CANADIAN AGRICULTURAL INJURY REPORTING

The Canadian Agricultural Injury Reporting (CAIR) is a national program that is funded by the Canadian Agricultural Safety Association (CASA). CAIR is a collaborative program involving various organizations from across Canada. It is coordinated from a national office at the Injury Prevention Centre in the School of Public Health, University of Alberta, in Edmonton, Alberta. The people and organizations that contribute to CAIR include researchers, government agencies and the agricultural industry.

1. Pickett W, Hartling L, Brison RJ, Guernsey J (1999). Fatal farm injuries in Canada. Can. Med Assoc. J. 160:1843-1848.
2. SMARTRISK, (2009). The Economic Burden of Injury within the Agricultural Population in Canada. SMARTRISK: Toronto, ON (unpublished).
3. National Children's Centre for Rural and Agriculture-related Health and Safety, Marshfield Clinic Research Foundation, 2006. Available at: http://www.marshfieldclinic.org/nccrahs/?page=nccrahs_aboutus_center_highlights.
4. Irwin, John, Stephen McBride and Tanya Strubin. 2005. "Child and Youth Employment Standards: The Experience of Young Workers Under British Columbia's New Policy Regime." Canadian Centre for Policy Alternatives, September 2005. 40 pp.
5. Ontario Ministry of Labour, 2006; Workers Compensation Board of Prince Edward Island, 2006.
6. Canadian Standards Association. Available at: http://www.csa.com/
7. Government of Canada, 2003. Available at: http://www.canadiancrc.com/UN_CRC/UN_Committee_ Rights_Child_Canada_2nd_Report- Over- view_SEP_2003_34th_Session.aspx

The main purpose of CAIR is to collect and analyze information on agriculture-related injuries from across Canada. CAIR established national standards for the collection of agriculture-related fatality and hospitalization data. Although a very rich data source, in 2002, CAIR ceased the collection of hospital admission data on a national basis due to budget cuts. The collection of hospital admissions data requires the review of hospital records in order to extract the circumstances around the injury producing event. Due to the sheer number of hospital admissions annually, the costs proved to be prohibitive.

CAIR's vision: To be a pillar of agricultural safety providing a comprehensive national system of surveillance for fatal and non-fatal agricultural injuries.

CAIR's mission: To provide Canada with national and provincial leadership in the prevention of agricultural injuries as a world leader in gathering information, conducting research, and translating knowledge into products and services.

CAIR strives to ensure that fatality injury data are collected, compiled, and analyzed in a standard manner by all provinces and that the information is interpreted and communicated in ways that are helpful to those in the agricultural industry.

CAIR's primary audience is individuals within the agricultural industry who need to make informed decisions about safety programs and policy. CAIR's reports represent one approach to making these data accessible to this audience.

Other dissemination formats include articles in scientific journals, presentations at national conferences and information, on casa-acsa.ca.

1.4 THE USES OF CAIR DATA

CAIR has developed a surveillance system for Canada that describes the occurrence and patterns of agriculture-related injuries at a higher level of detail than was available previously. At both national and provincial levels, CAIR has provided evidence that has assisted in the development of priorities for health and safety programs as well as strategies for the targeting of these initiatives. CAIR data have also facilitated the post-implementation assessment of injury prevention programs.

Agriculture-related safety specialists and others require objective evidence so that they can promote awareness of agriculture-related injury issues and advocate for the allocation of additional resources to injury prevention and research programs. CAIR information has been used repeatedly to assist in advocacy efforts. This has contributed to the development of informed safety policy in the agricultural industry and to the funding of safety programs at international, national, and provincial levels.

CAIR has provided baseline evidence to support several applied research projects such as the Saskatchewan Farm Injury Cohort Study funded by the Canadian Institutes of Health Research (2005 – 2010). These projects include focused investigations aimed at the prevention of agriculture-related injuries in children and the elderly, studies of agriculture-related machinery injuries and their causes, and studies examining the economic burden of agriculture-related injuries.

1.5 THE CHALLENGES OF INJURY CONTROL IN AGRICULTURE

In other industries, victims of occupational injuries are usually workers aged 18 to 65. Agriculture is unique in that children and the elderly sustain significant numbers of severe work-related injuries. This is partly because farms and ranches are not just work sites, but also places where people of all ages live and participate in recreational activities. Also, unlike other industries, it is common for farmers and ranchers to work full time and to operate tractors and other heavy machinery well into their 70s and 80s.

The prevention of injuries in agricultural work settings is challenging because of the unique nature of the agricultural work environment. Also, in most jurisdictions, agriculture is not a heavily regulated industry in terms of occupational health and safety standards. Unlike other industrial workplaces, many Canadian agricultural workplaces have not benefited from modern industrial hygiene and safety practices.

The composition of the agricultural workforce, farming practices, and safety practices is geographically diverse. This diversity adds to the difficulty of establishing and enforcing safety standards. There has traditionally been reliance on voluntary, rather than regulatory, safety standards; however, the effectiveness of voluntary safety standards has not been well evaluated.

CHAPTER 2: METHODS

2.1 IDENTIFICATION OF AGRICULTURE-RELATED FATALITIES

A review of CAIR's data collection and analysis methods is detailed in this report. The process used in the identification of agriculture-related fatalities varies by province.

This is a general description of the process:

1. Potential sources of agriculture-related fatality data are identified. These are kept by a variety of agencies that vary by province. Examples of these agencies include: offices of the provincial coroner or chief medical examiner, occupational health agencies, departments of vital statistics, ministries of transportation and provincial agriculture-related safety associations.

2. A comprehensive list of all potential agriculture-related fatalities is assembled within each province. These lists draw upon each available source of fatality data.

3. Once cases are identified, detailed case reports are sought for review and data abstraction. The main sources of information are coroners' investigation reports, occupational safety and health agency investigation reports, and RCMP / provincial police reports.

4. Data abstraction and entry are completed on each eligible fatality. This is done in a consistent manner using a standard data abstraction form (Appendix C). Data Abstraction is completed on-site at provincial chief coroners' or medical examiners' offices. Data are then sent to the national site for verification, coding, and analysis.

2.2 KEY DEFINITIONS

Agriculture-related Fatalities:
CAIR defines an agriculture-related fatality as:

1. Any unintentional injury resulting in fatality that occurs during activities related to the operation of a farm or ranch in Canada and / or

2. Any unintentional injury resulting in fatality that involves any hazard of a farm or ranch environment in Canada (excluding fatal non-work-related injuries that take place in the farm residence). This includes fatalities that occur away from agricultural work locations if agriculture-related work is being done; e.g., transporting workers, livestock, supplies, or harvested crops on public highways; farm animals roaming on public highways. Fatalities in which victims are killed because a third party is engaged in agriculture-related work are also included.

Population of Fatalities: All persons who live, work on, or visit a Canadian farm or ranch (as defined below), as well as all persons who are fatally injured in other locations (such as public highways) as a result of agriculture-related activity and all temporary foreign workers under the seasonal agriculture workers program from Citizenship & Immigration Canada. See Appendix D: Agriculture Populations.

Farm: In the Census of Agriculture, Statistics Canada defines a farm as "any farm, ranch or other agricultural holding that produces at

least one of the following agricultural products intended for sale: crops, livestock, poultry, animal products, greenhouse or nursery products, mushrooms, sod, honey, or maple syrup products." (Canada Census of Agriculture, 1996, Statistics Canada.)

Farm Population: The population covered by the Agriculture–National Household Survey Linkage database and the estimates derived from it also changed in two ways in 2011:

- The definition of the farming population changed. In the years prior to 2011, only operators and their families who resided on the farm at any time in the previous 12 months were included in the farming population. In 2011, the on-farm restriction was removed. Operators and their families not residing on a farm are also included.

- Residents of collective dwellings were not eligible to receive the National Household Survey and, thus, are not represented in the Agriculture–National Household Survey Linkage database.

The farm populations used to calculate rates presented in this report are based on the 2011 definitions and numbers from previous census periods were re-tabulated accounting for the current definition.

2.3 CONFIDENTIALITY OF CAIR DATA

Data are maintained in an electronic database that is managed centrally by the National Coordinator under the supervision of the CAIR Co-Directors. The provincial collaborators retain the complete data set for their own provinces.

Access to the national dataset is strictly limited to CAIR collaborators for the following activities:

1. CAIR provincial collaborators assigned the task of producing special technical reports for Canada.

2. CAIR collaborators who have permission from the CAIR group to conduct special analyses for the purpose of producing scientific reports for submission to peer-reviewed journals.

3. The National Coordinator and CAIR Co-Directors for the purpose of maintaining the database and producing periodic comprehensive reports for Canada.

4. To support agriculture-related injury prevention initiatives by others through analyses presented as tabular data.

2.4 ANALYSIS

The analysis presented in this report is descriptive and not interpretive to imply cause and effect.

It has three main objectives:

1. to illustrate the magnitude of the agriculture-related fatality problem in Canada,

2. to compare trends in the causes and occurrence of fatal agriculture-related injuries among genders and age groups, and

3. to identify emerging patterns of injuries.

The statistics used include simple counts and frequencies as well as cross tabulations. To allow for comparison across the provinces and years, age-standardized rates were calculated using the direct method. This method controls for potential sources of bias resulting from variations in age distributions of populations. Formal hypothesis testing methods and tests of statistical significance were not employed in comparisons.

Rates of fatal agriculture-related injuries are presented in this report. The numerators used in calculating these rates are the numbers of agriculture-related fatalities for particular age categories and mechanisms of injury. These include fatal injuries to farm residents, hired agriculture-related workers, contractors, persons travelling on public highways, and a small number of visitors to farms. Denominators for these rate calculations are taken from the 1996, 2001, 2006, 2011, and 2016 Canada Census of Agriculture and extrapolated for the years in which the census was not performed. Notably, 2014-2020 is data is incomplete for British Columbia and 2016 is incomplete for Manitoba.

Joinpoint, Version 3.3.1. April 2008; Statistical Research and Applications Branch, National Cancer Institute.

Methods by Kim HJ, Fay MP, Feuer EJ, Midthune DN.

Permutation tests for joinpoint regression with applications to cancer rates. Stat Med 2000;19:335-51 (correction: 2001;20:655).

In addition to the Canada Census of Agriculture population, temporary foreign workers under the seasonal agriculture workers program from Citizenship & Immigration Canada were included. For the year(s) in which provinces did not submit fatality data, the populations for those years were not included in the denominator.

Some caution is warranted in the interpretation of the rates because it is not possible to obtain complete data on the full population at risk, or to determine relative amounts of exposure to agriculture-related work and associated hazards. Also, the Canada Census of Agriculture includes all farm and ranch residents, some of whom have relatively little exposure to agriculture-related work hazards, but excludes visitors to farms or ranches and agricultural workers who are not resident on farms or ranches. The accuracy of agriculture census information may vary among provinces, but is the best source of denominator information available at this time.

The trend change of the age-standardized rates over time is expressed in average annual per cent between time periods. The sum of the average percentage change will give the overall change. The trending was done with the Joinpoint Regression Program. To ensure the data in this report are illustrated in an effective and useful manner, data fields with small numbers are often not included in graphs. In these cases, a note is included below the graph.

2.5 DATA LIMITATIONS

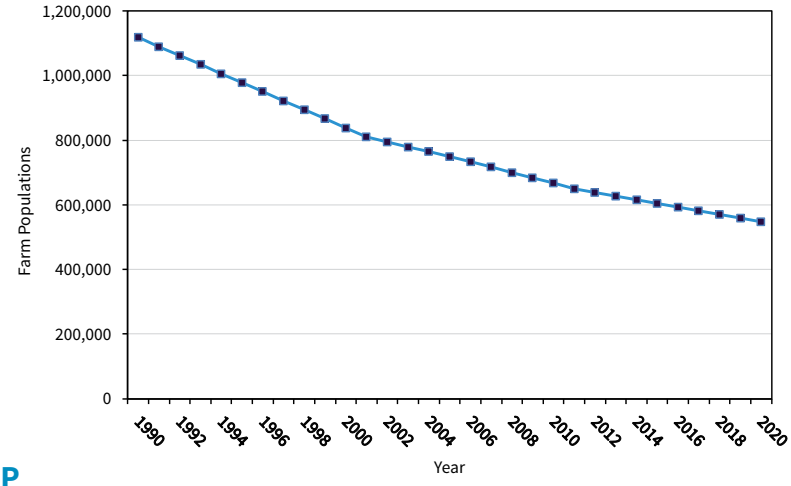
The data is collected in accordance with section 2.1 (Identification of Agriculture-Related Fatalities). However, there are limitations to this data collection; if the injury has not been identified as having occurred on the farm, having involved agricultural machinery, or having been agricultural activities, the incident is not captured.

Data abstraction is completed on-site at provincial chief coroners' or medical examiners' offices. The quality of the data is reflective of the detailed documentation available in the records at the provincial chief coroners' or medical examiners' offices. Data is collected in a consistent manner using a standard data abstraction form (Appendix C). Data are then sent to the national site for verification, coding, and analysis.

There are also limitations identifying migrant workers. The numbers of migrant workers included in the denominator for calculating of rates only accounted for those workers who participated in the seasonal agricultural workers program from Citizenship & Immigration Canada.

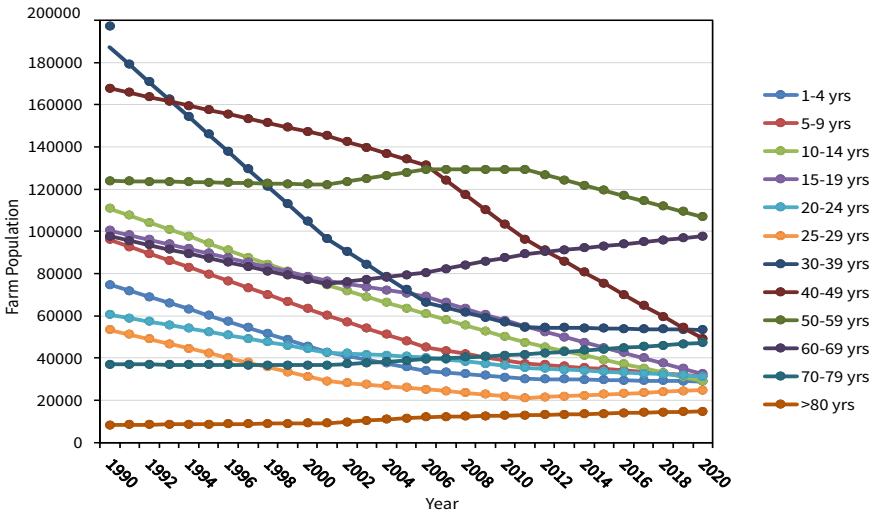
FARM POPULATIONS

Over the period from 1990 to 2020, there has been a decrease in the Canadian farm population of 51%. This equates to 571,033 fewer people on farms. In 1990, there were 1,118,053 people counted in the agriculture census. Based on linear extrapolation using the 1996, 2001, 2006 and 2011 Canada Census of Agriculture, the agricultural population dropped to 547,020 (see Appendix D). See key definitions (Chapter 2.2) for the changes to inclusion on the Agriculture-National Household survey.



FARM POPULATION BY AGE GROUP

Over the time period from 1990 to 2020, the age group which experienced the largest percentage decline in farm population was those between the ages of 10 to 14 years, with a decline of 74%. This was followed by adults 30 to 39 years of age with a decline of 72%, adults 40 to 49 years of age with a decline of 71%, and youth 15 to 19 years with a decline of 68%. There were increases in the older farm population, with the largest increase experienced by those 80 years of age and older with a 78% increase, followed by those 70 to 79 years of age with an increase of 28%.

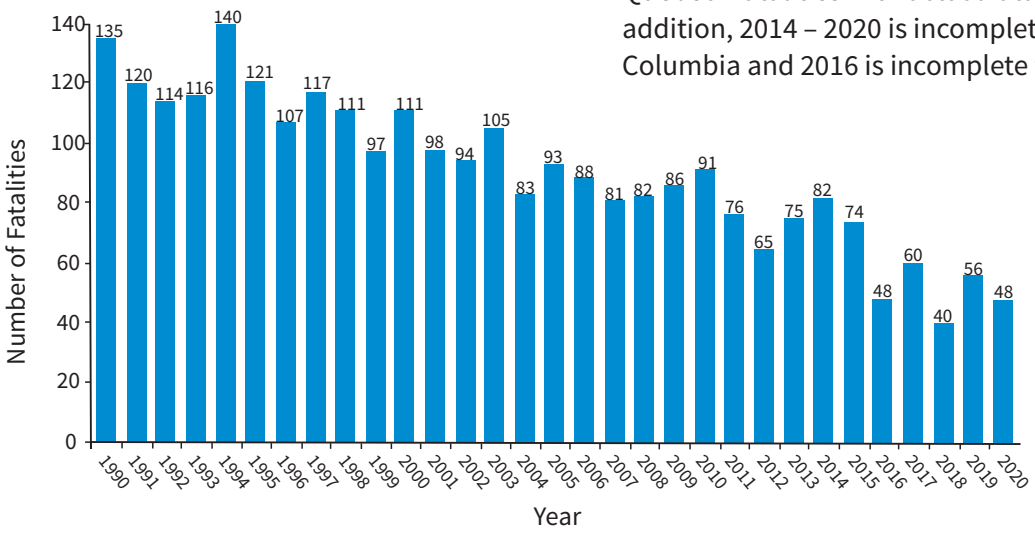


CHAPTER 3: AGRICULTURE-RELATED FATALITIES, 1990 – 2020

3.1 FATAL AGRICULTURE-RELATED INJURIES BY CALENDAR YEAR, 1990 – 2020 (2,814 FATALITIES)

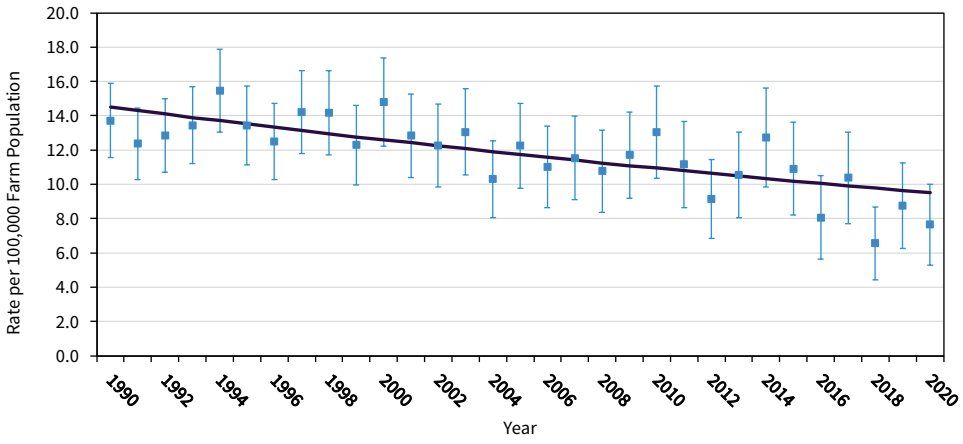
From 1990 to 2020, there were 2,814 agriculture related fatalities in Canada; an average of 91 fatalities each year. During the first 16 years of the surveillance period (1990 – 2005), there was an average of 110 fatalities each year. During the last 15 years (2006 – 2020), the average number of fatalities dropped to 70 each year.

Note: The number of fatalities in previous reports differ from those in the current report. This is due to the replacement of "extrapolated Quebec" fatalities with actual fatality counts. In addition, 2014 – 2020 is incomplete for British Columbia and 2016 is incomplete for Manitoba.



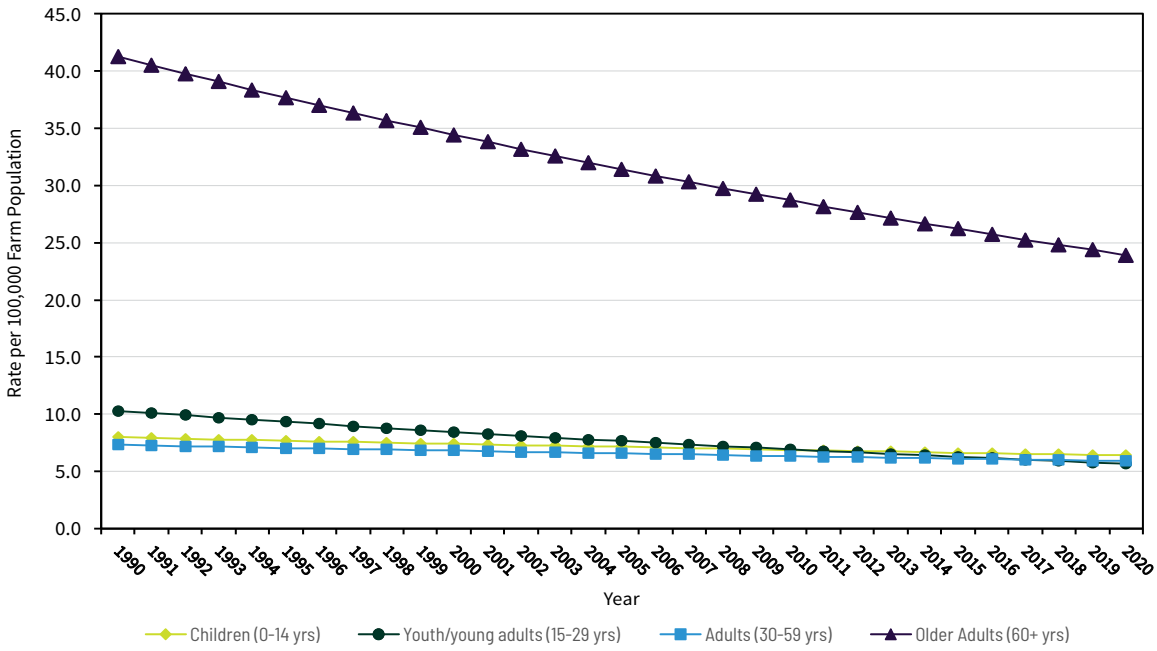
3.2 FATAL AGRICULTURE-RELATED INJURY RATES BY YEARS (AGE-STND), 1990 – 2020

Over the 31-year period, the overall agriculture fatality rate experienced a statistically significant decrease of 1.4% annually.



Note: for provinces with incomplete numbers, the rate has been adjusted accordingly.

3.3 FATAL AGRICULTURE-RELATED INJURY COMPARISON BY AGE GROUP, 1990 – 2020



When comparing the fatality rates by population group, each age group experienced a decrease in fatality rate.

Children (0 – 14 years) had a 0.7% decrease each year. Youth / young adults (15 – 29 years) had a statistically significant decrease of 2.0% each year.

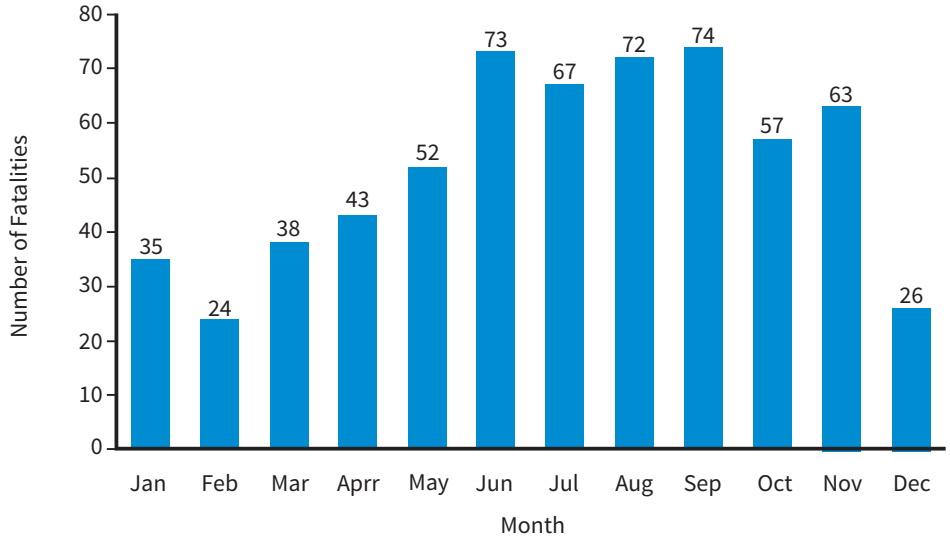
Adults (30 – 59 years) experienced a decrease in the fatality rate with an average of 0.7% annually.

Older adults (60+ years) experienced a statistically significant decrease of 1.8% each year.

From this point forward, the report will focus on the most current 10 years of data available, 2011 – 2020

CHAPTER 4: AGRICULTURE-RELATED FATALITIES, 2011 – 2020

4.1 FATAL AGRICULTURE-RELATED INJURY BY MONTH, 2011 – 2020



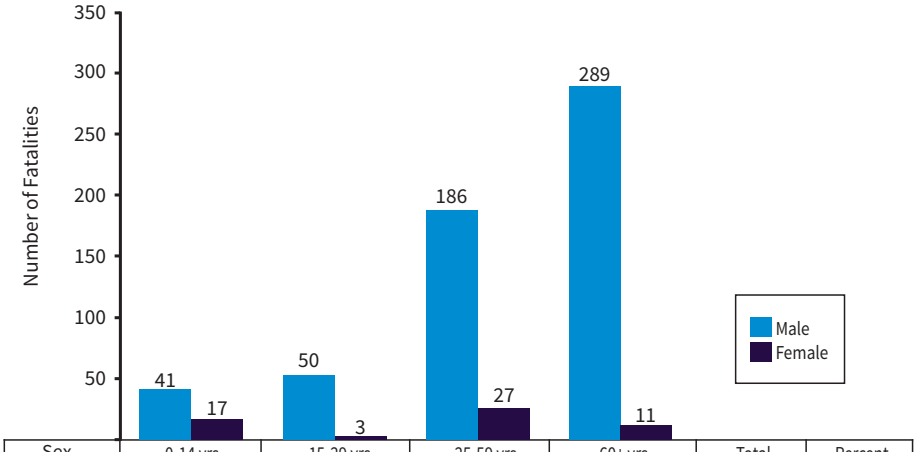
Of the 624 agriculture-related fatalities in Canada, 63% (n=395) occurred from May to October.

The highest proportion of fatalities took place in June, August, and September; each with 12%.

Another 11% of the fatalities occurred in the month of July.

Relatively few fatal agriculture-related injuries occurred in the winter months of December to March.

4.2 FATAL AGRICULTURE-RELATED INJURY BY AGE AND SEX, 2011 – 2020



Sex	0-14 yrs	15-29 yrs	25-59 yrs	60+ yrs	Total	Percent
Male	41	50	186	289	566	91
Female	17	3	27	11	58	9
Total	58	53	213	300	624	100
Percent	9	8	34	48	100	

The vast majority (91%) of the persons who died in agriculture-related injury events were male.

The ratio of males to females was highest for the 60+ age group (26:1), and lowest for the 1 to 14 year age group (2:1).

4.3 FATAL AGRICULTURE-RELATED INJURIES BY SEASON, 2011-2020

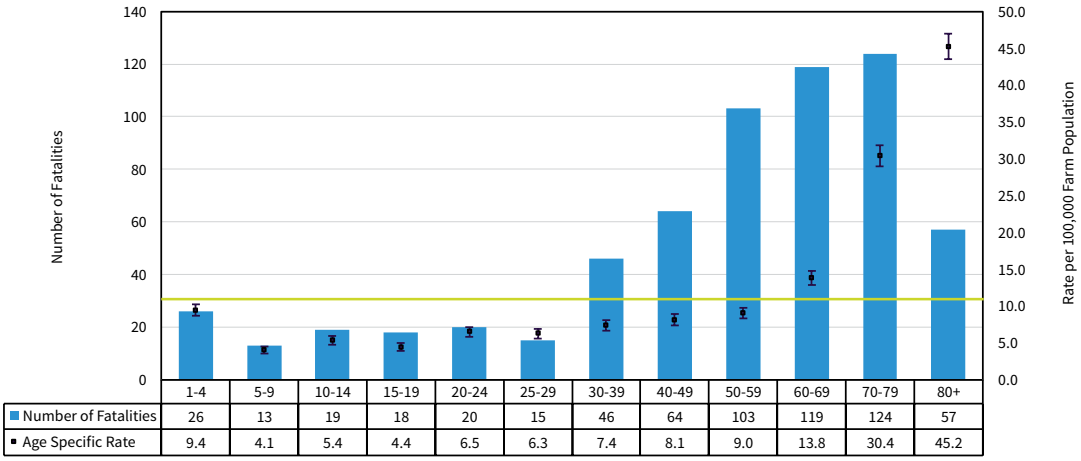
Spring	Summer	Fall	Winter
Mar – May	Jun – Aug	Sep – Nov	Dec – Feb
Machinery rollover 15%	Machinery runover 18%	Machinery rollover 17%	Entangled/caught in machinery 13%
Machinery runover 9%	Machinery rollover 16%	Machinery runover 15%	Machinery runover 9%
Pinned/struck by machine component or collapsing machine 9%	Pinned/struck by machine component or collapsing machine 8%	Entangled/caught in machinery 13%	Pinned/struck by machine component or collapsing machine 8%

Overall, the top 3 mechanisms of agriculture-related fatalities were: machine rollovers 15%, machine runovers 14%, and being pinned or struck by a machine component 8%.

Seasonally, machine rollovers were the leading causes of death during the 2 most active seasons: summer and fall. This was also the second leading cause of death in the spring.

The per cent is based on all injury fatalities within each season. Not adjusted for seasonal variability.^

4.4 FATAL AGRICULTURE-RELATED INJURIES BY NUMBER / RATE BY AGE GROUP, 2011-2020



	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-49	50-59	60-69	70-79	80+
Number of Fatalities	26	13	19	18	20	15	46	64	103	119	124	57
Age Specific Rate	9.4	4.1	5.4	4.4	6.5	6.3	7.4	8.1	9.0	13.8	30.4	45.2

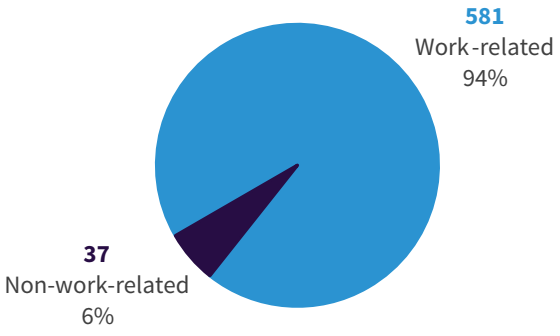
The overall agriculture fatality rate was 10.7 per 100,000 farm population.

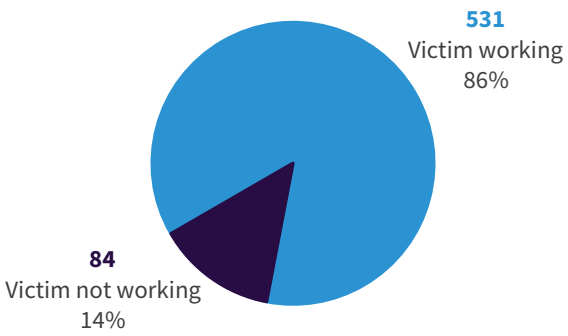
The age groups with the highest number of fatalities, those 70 to 79 years of age (n=124 fatalities) and those 60 to 69 years of age (n=119 fatalities) did not have the highest rates; 30.4 fatalities per 100,000 farm population and 13.8 fatalities per 100,000 population respectively.

The age group with the highest fatality rate was those 80 years of age and older, with a rate of 45.2 fatalities per 100,000 farm population (n=57 fatalities).

^ Data not adjusted for environmental conditions or the effects of seasonal weather patterns.

4.5 FATAL AGRICULTURE-RELATED INJURIES: BY RELATIONSHIP TO AGRICULTURE-RELATED WORK, 2011 – 2020





Of the 624 agriculture-related fatalities in Canada, 94% (n=581 fatalities) were work-related. The fatalities that were non-work-related (6%) were due to hazards of the farm environment.

Most adults who died were engaged in agriculture-related work, whereas the majority of children who were killed in work-related injury events were not working themselves.

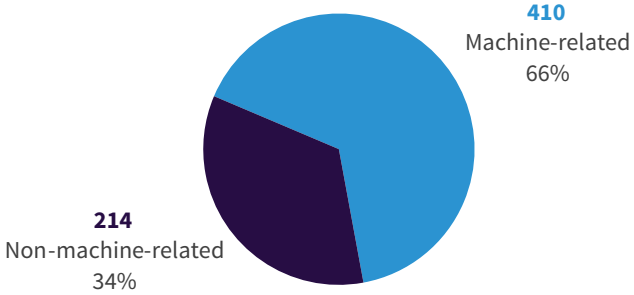
There were 6 fatalities with insufficient documentation to determine if work was being performed at the time of the incident. Of those killed in agriculture-related injury events, 86% of the victims were engaged in agriculture-related work. Whereas, 14% of those killed in agriculture-related injury events were not working at the time of the incident.

There were 9 fatalities with insufficient documentation to determined if the deceased was working or not working at the time of the incident.

4.6 MACHINE-RELATED FATALITIES

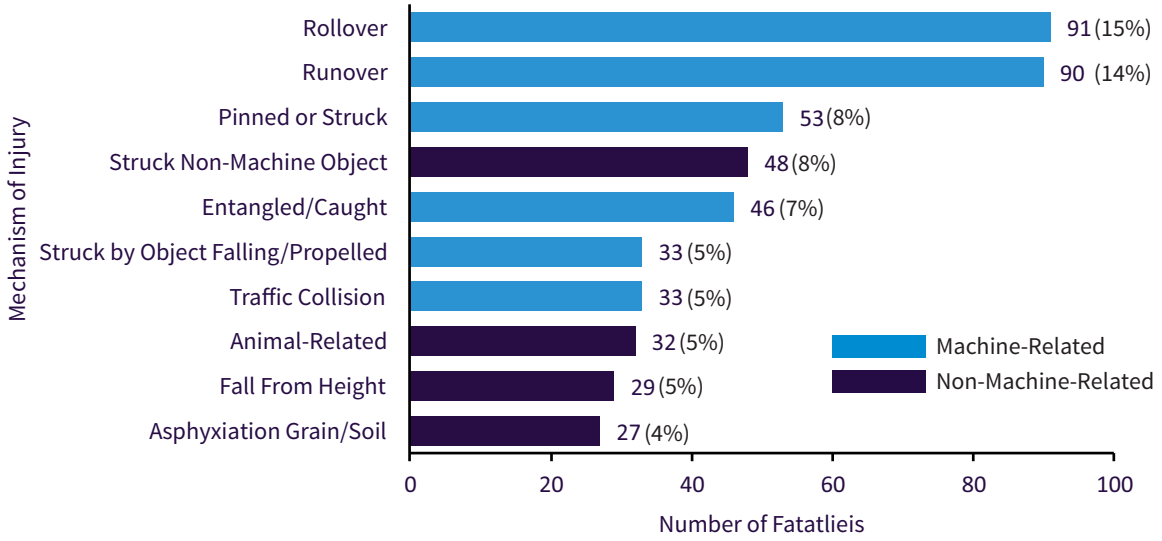
Sixty-six percent (n=410 fatalities) of agriculture-related fatalities were machine-related. The leading machine-related mechanisms of fatal injury were machine rollovers, machine runovers, and machine entanglements. (Figure 4.6).

There were 214 agriculture-related fatalities that were non-machine-related (34%) included being struck by an animal or an object, drownings (mainly in children), falls from height, and exposure to toxic substances. (Figure 4.6).



Note: there was one fatality in which there was insufficient documentation to determine if the injury was machine or non-machine-related, and therefore, the fatality was counted once in each category.

4.7 FATAL AGRICULTURE-RELATED INJURIES BY THE TOP 10 CAUSE OF INJURY, 2011 – 2020



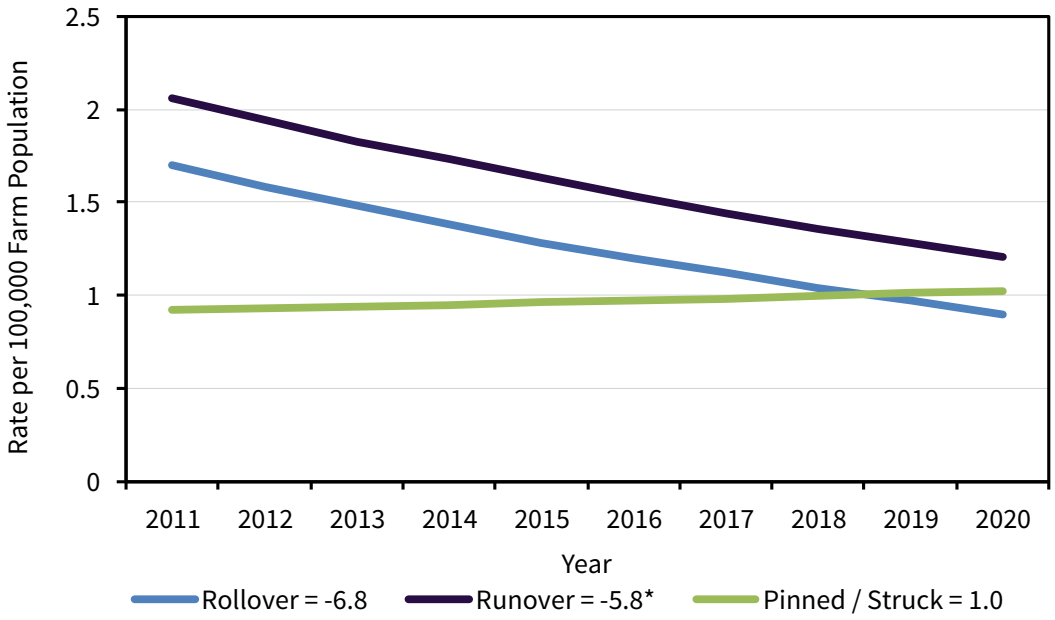
Over a third of all agriculture-related fatalities in Canada (38%) were due to three machine-related causes: machine runovers, machine rollovers, and being pinned or struck by a machine component (total of 234 fatalities).

Machine rollovers and machine runovers accounted for 15% and 14% of fatalities respectively. Being pinned or struck by a machine component (8%), and being struck by a non-machine object accounted for another 8% of fatalities. Machine-related entanglements accounted for 7%; being struck by an object falling or being propelled from machinery, traffic collisions, animal-related, and falls from height fatalities accounted for 5% each.

Fatalities due to asphyxiation from grain or soil accounted for 4% of the agriculture-related fatalities.

There were an additional 142 agriculture-related fatalities involving 19 other mechanisms of injury that were not included in the above graph.

4.8 FATAL AGRICULTURE-RELATED INJURIES BY MACHINE-RELATED MECHANISM, 2011 – 2020

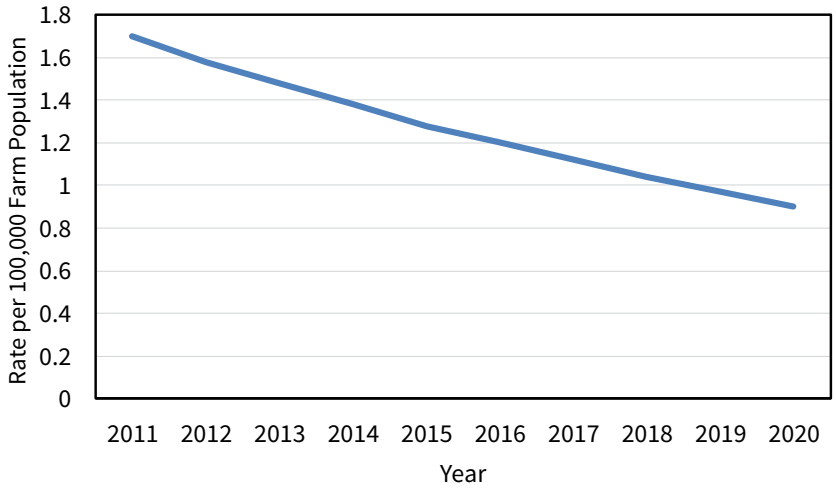


* Average percent change statistically significant

When analyzing the top 3 machine-related mechanisms of injuries over time, fatality rates due to rollovers experienced a decrease on average of 6.8% annually, and the runover fatality rate had a statistically significant decrease of 5.8% each year.

The fatality rate for being pinned / struck by a machine component increased an average of 1.0% annually.

4.9 FATAL AGRICULTURE-RELATED INJURY ROLLOVERS (age-standardized), 2011 – 2020



Over the 10-year period from 2011 to 2020, there 91 machine-related rollover fatalities. This equates to 9 deaths each year.

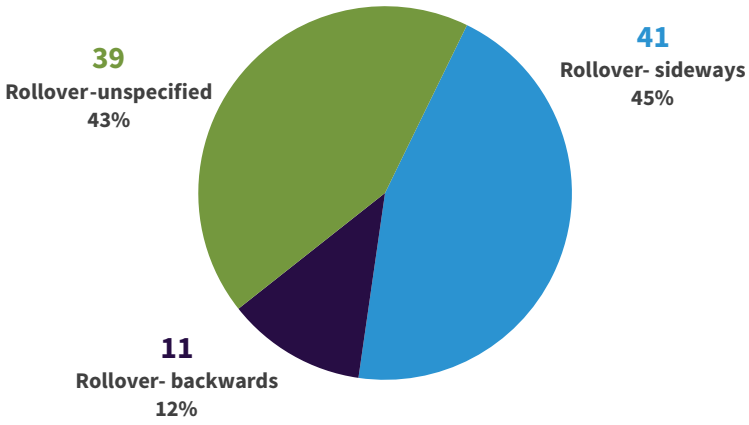
Over this time period, the rollover fatality rate decreased an average of 6.8% each year.

4.10 FATAL AGRICULTURE-RELATED INJURY ROLLOVERS BY ROLLOVER TYPE, 2011 – 2020

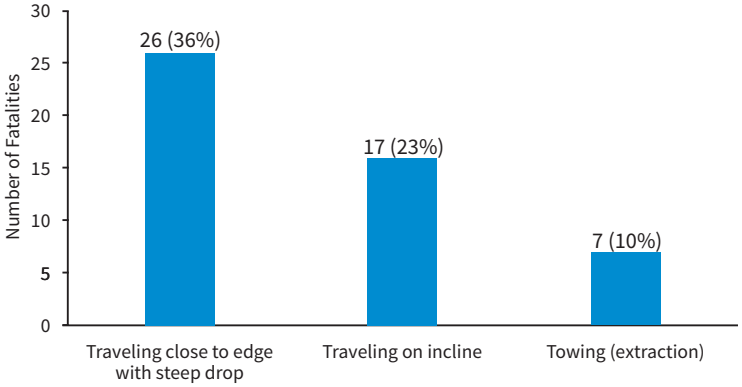
Of the 91 rollover fatalities, 45% (n=41 fatalities) occurred sideways in direction.

Another 12% (n=11 fatalities) of the rollovers were backwards, and in 43% (n=39 fatalities), either the direction of the rollover could not be determined or there was insufficient documentation to determine the direction of the rollover at the time of death.

The majority of the rollover fatalities involved a tractor (69%), and another 16% involved an off-road vehicle.



4.11 FATAL AGRICULTURE-RELATED INJURY ROLLOVERS BY THE TOP 3 IMMEDIATE CAUSES OF ROLLOVERS, 2011 – 2020



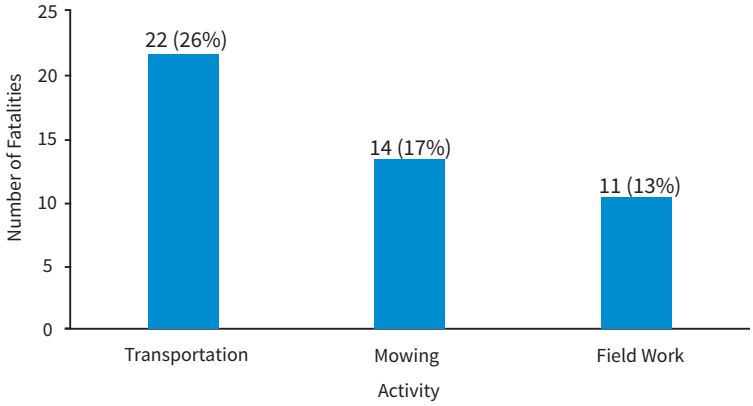
Of the 91 rollover agriculture-related fatalities, 74 (81%) of the deaths had sufficient documentation to determine an immediate cause. For the remaining 17 (19%) of the deaths, there was insufficient documentation to determine an immediate cause.

Of the 74 deaths with an immediate cause documented, 26 (36%) of the rollovers were as a result of the deceased driving too close to the edge (of slanted or uneven terrain). Another 17 fatalities (23%) were as a result of machinery travelling on an incline, and 7 (10%) of the rollover fatalities involved towing (extraction) of an object.

The remaining 8 categories (n=24 fatalities) accounted for the remaining 32% of rollovers.

4.12 FATAL AGRICULTURE-RELATED INJURY ROLLOVERS BY THE TOP 3 ACTIVITIES PRIOR TO ROLLOVER, 2011 – 2020

Of the 91 rollover agriculture-related fatalities, 84 (92%) of the deaths had sufficient documentation to determine an activity prior to death. For the remaining 7 (8%) deaths, there was insufficient documentation to determine the activity prior to death.

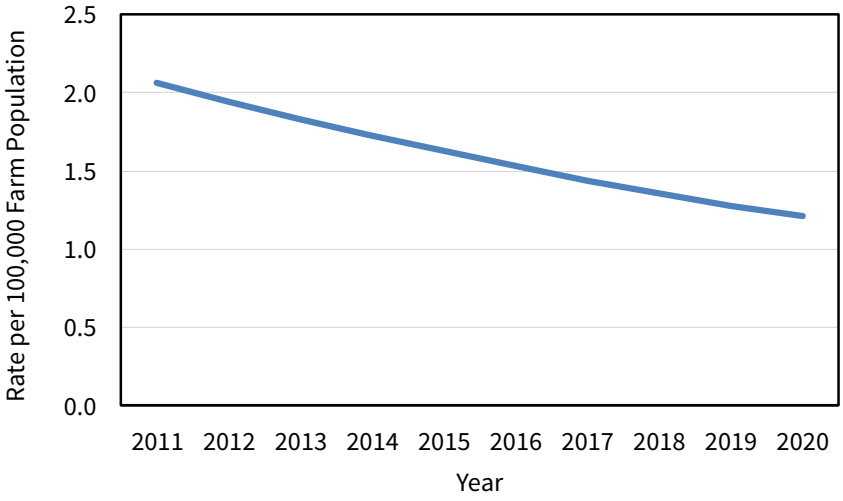


Of the 84 deaths with a documented activity, 22 (26%) of the rollovers identified transportation as the most common activity prior to death. This involves travelling on highways / roadways.

Another 14 fatalities (17%) involved mowing prior to deaths, and in 11, (13%) the death involved field work activities.

The remaining 7 categories (n=37 fatalities) accounted for remaining 44% of rollovers.

4.13 FATAL AGRICULTURE-RELATED INJURY RUNOVERS (age-standardized), 2011 – 2020



Over the 10-year period from 2011 to 2020, there were 90 machine-related runover fatalities. This equates to 9 deaths each year.

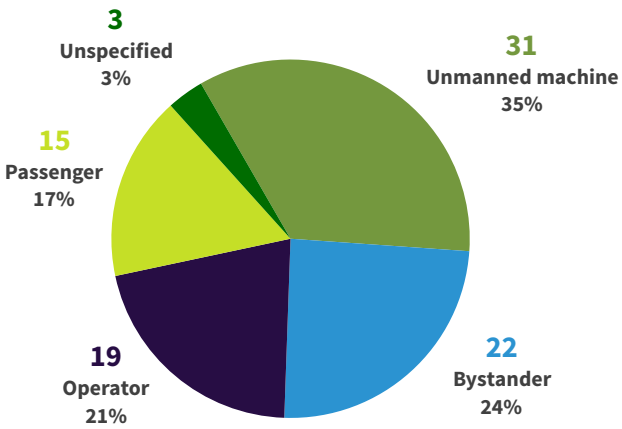
Over this time period, the runover fatality rate experienced a statistically significant decrease with an average of 5.8% each year.

4.14 FATAL AGRICULTURE-RELATED INJURY RUNOVERS BY PERSON, 2011 – 2020

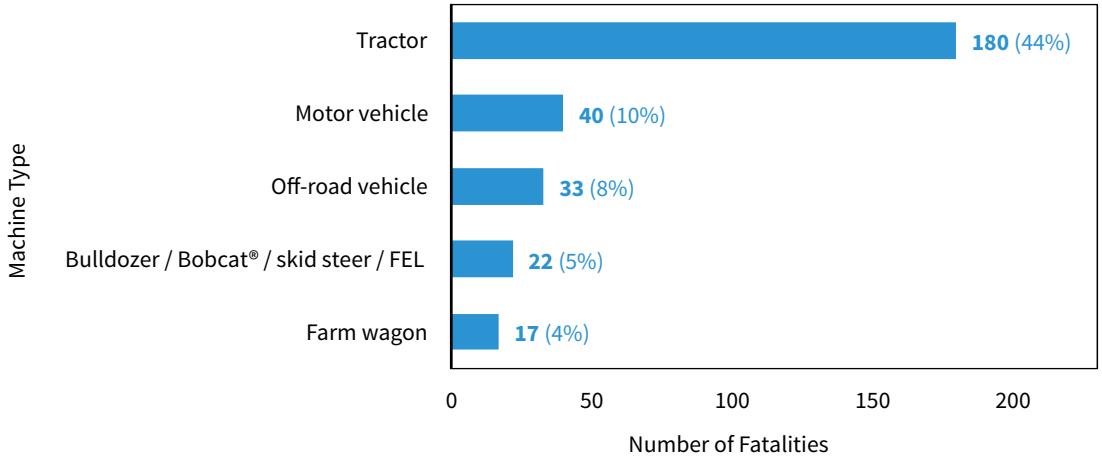
There were 90 agriculture-related runover fatalities from 2011 to 2020. Alighted operator runovers (unmanned machine) were the most frequent type of fatal runover (35%). In this kind of injury event, the victim is runover by a vehicle they had left running or unblocked on a slope.

Bystander runovers were the second-largest percentage of runover fatalities (24%), followed by fallen operator runovers (21%), and passenger / extra rider runovers (17%).

There were 3 fatalities in which the decedent was not identified as an operator, passenger, or bystander.



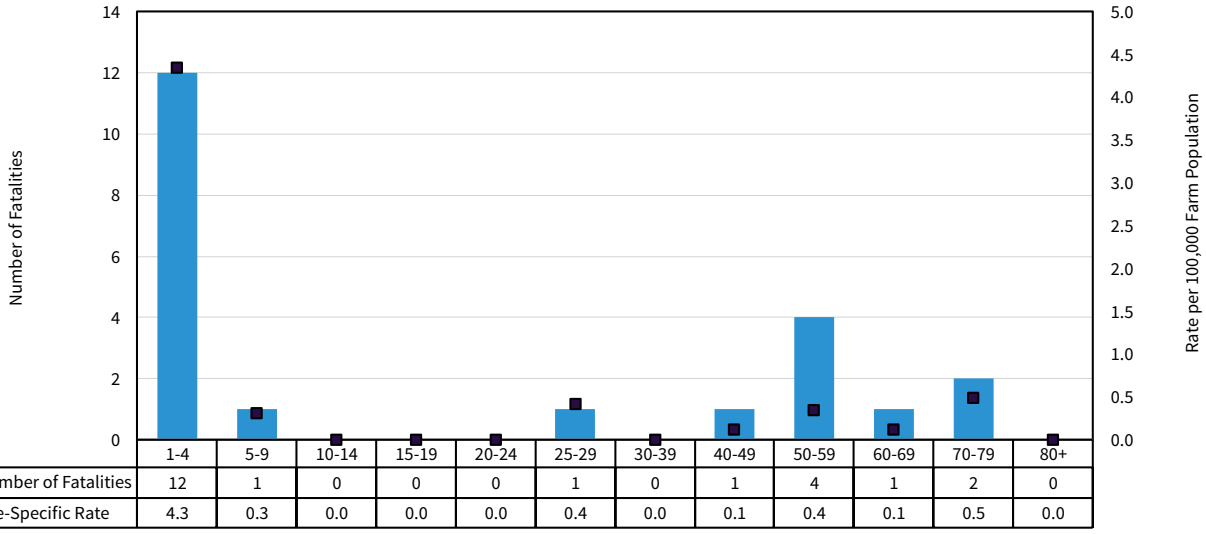
4.15 FATAL AGRICULTURE-RELATED INJURIES BY TOP 5 MACHINE TYPES, 2011-2020



Of the 411 machine-related fatalities, 44% (n=180 deaths) involved a tractor. Another 10% (n=40 deaths) involved a collision between machinery and another vehicle. This could include a car, pick up truck, semi-trailer, off-road vehicle, motorcycle, or dirt bike.

Another 8% (n=33 deaths) involved an off-road vehicle, 5% (n=22 deaths) involved a bulldozer / Bobcat® / skid steer or front end loader not documented as being attached to a tractor. Fatalities involving a farm trailer / wagon accounted for 4% (n=17 deaths).

4.16 FATAL AGRICULTURE-RELATED BYSTANDER RUNOVERS BY AGE GROUP, 2011 – 2020



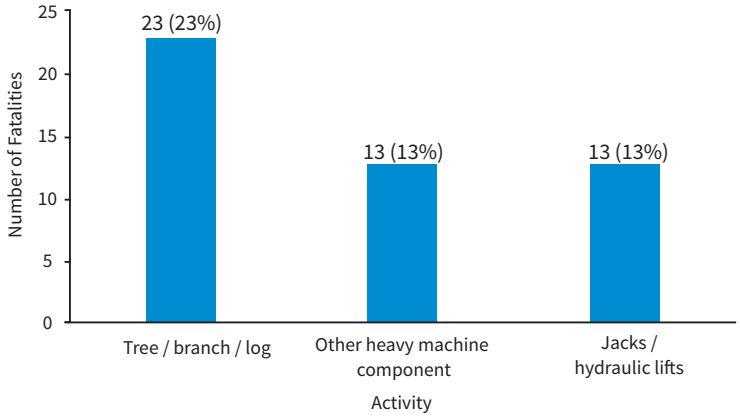
	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-49	50-59	60-69	70-79	80+
Number of Fatalities	12	1	0	0	0	1	0	1	4	1	2	0
Age-Specific Rate	4.3	0.3	0.0	0.0	0.0	0.4	0.0	0.1	0.4	0.1	0.5	0.0

Of the 22 bystander runovers, 55% were children between 1 and 4 years of age. Children between 1 and 4 years of age had the highest number of bystander runover fatalities (n=12 fatalities) and the highest age-specific rate of 4.3 fatalities per 100,000 farm population.

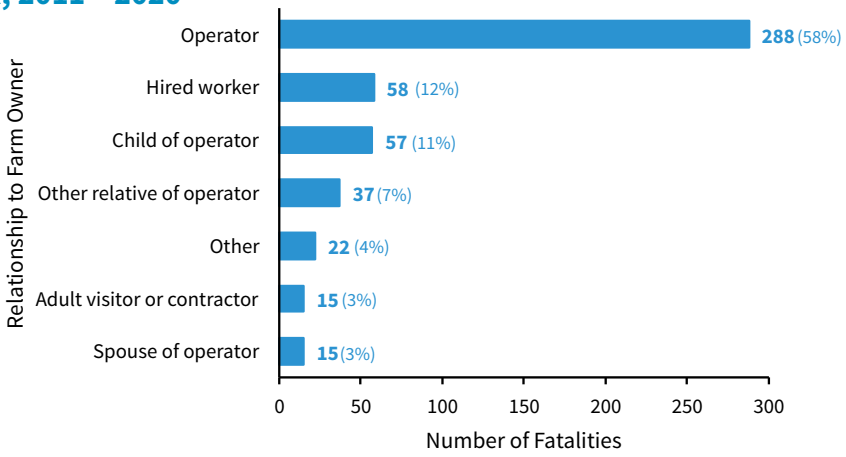
4.17 FATALLY PINNED OR STRUCK BY MACHINE AND NON-MACHINE INJURIES BY OBJECT, 2011 – 2020

There were 101 agriculture-related fatalities as a result of being pinned and / or being struck by machinery and non-machinery objects.

Being struck by a tree / branch or log was the most common object, with 23 fatalities (23%). Being struck by a heavy machine component accounted for 13 fatalities (13%), and being killed as a result of jacks or hydraulic lift failure accounted for 13 deaths (13%).

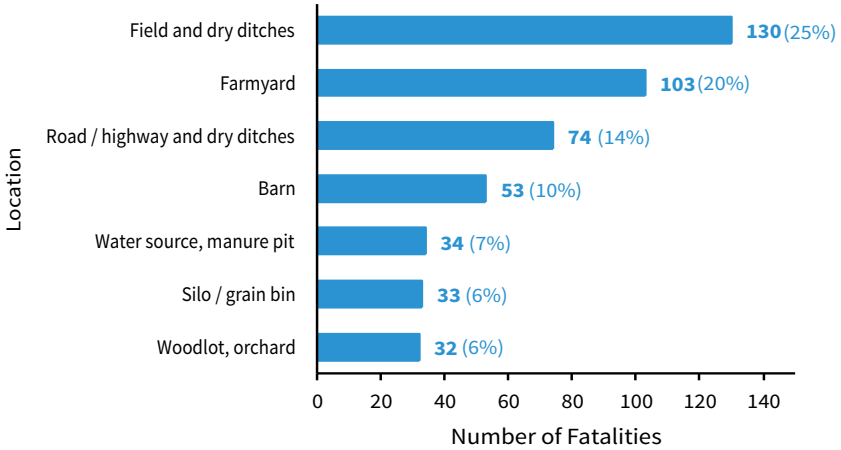


4.18 FATAL AGRICULTURE-RELATED INJURIES BY RELATIONSHIP TO FARM OPERATOR, 2011 – 2020



Of the 500 known relationships of the deceased to the farm owner, the majority 58% (n=288 deaths) were the farm owner / operator themselves, while 12% (n=58 deaths) were identified as hired workers. Another 11% (n=57 deaths) were children of the farm owner / operator, and 7% (n=37 deaths) were identified as other relative of the operator. Of those other relatives, 35% (n=13 deaths) of the deceased were identified as the father of the farm owner / operator. Of the 22 "other" relationship to the owner deaths, 18 deaths (82%) involved traffic, therefore, "other" would include drivers / passengers who died as a result of a motor vehicle in a collision with farm equipment. Both the spouse of the operator and adult visitor / contractor accounted for 3% of the deaths (n=15 deaths each).

4.19 FATAL AGRICULTURE-RELATED INJURIES BY LOCATION, 2011 – 2020



Of the 522 known locations of death, the most frequent locations were fields and dry ditches with 25% (n=130 fatalities). The next location was farmyard, accounting for 20% with 103 fatalities. Agriculture-related deaths occurring on the road / highway and dry ditches accounted for 14% (n=74 deaths).

4.20 FATAL AGRICULTURE-RELATED INJURIES, OTHER FACTS 2011 – 2020

Entanglements

- Of fatalities due to entanglement with adequate documentation, 46% were due to maintenance / repairs / or cleaning the machinery.

Animal-related

- Of the 32 animal-related fatalities:
  - 53% (n=17 deaths) involved a horse
  - 47% (n=15 deaths) involved cow / cattle

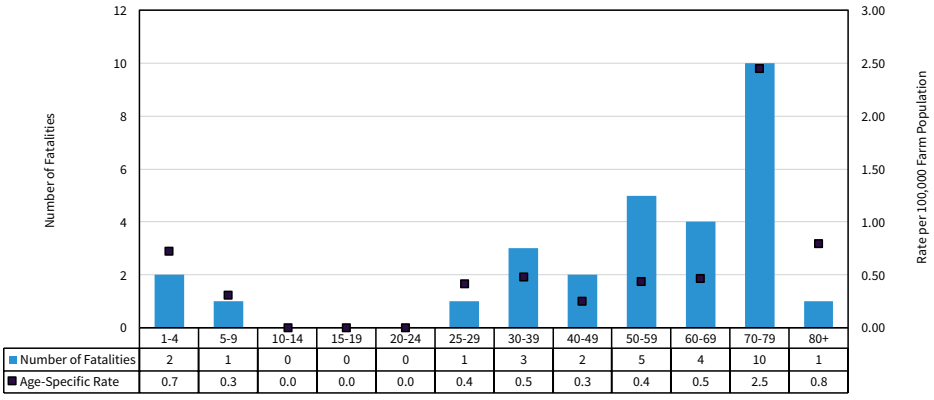
Fall from Height

- Of the 28 known fall locations,
  - 32% (n=9 fatalities) were as a result of a fall from ladder or scaffolding
  - 25% (n=7 fatalities) were as a result of falling from a silo or grain bin
  - 18% (n=5 fatalities) were as a result of a fall from a barn loft / upper floor / rafters

Drowning by Location

- Of the 29 non-machine and machine-related drownings
  - 41% (n=12 fatalities) occurred in a dugout
  - 21% (n=6 fatalities) occurred in lake / pond, swamp, slough
  - 14% (n=4 fatalities) occurred in a sewage / manure pit or lagoon

4.21 FATAL AGRICULTURE-RELATED DROWNINGS BY AGE GROUP, 2011 – 2020



	1-4	5-9	10-14	15-19	20-24	25-29	30-39	40-49	50-59	60-69	70-79	80+
Number of Fatalities	2	1	0	0	0	1	3	2	5	4	10	1
Age-Specific Rate	0.7	0.3	0.0	0.0	0.0	0.4	0.5	0.3	0.4	0.5	2.5	0.8

Of the 29 machine and non-machine-related drownings, older adults (70 to 79 years of age) had the highest number of drowning fatalities with 10 deaths, and a rate of 2.5 deaths per 100,000 population. Of those 70 to 79 years of age, 80% (n=8 deaths) involved machine-related drownings.

Of the 3 drownings of children less than 10 years of age, 100% were non-machine-related drownings.

APPENDIX A: DECISION RULES

INCLUSION OF FATALITIES AND INJURIES IN THE CAIR FATALITY DATABASE

Alcohol involvement
Fatal injuries where the victim was under the influence of alcohol were included in the database if they involved agriculture-related work or an agriculture-related hazard.

Fatalities on highways
Fatal injuries on public highways that involved agricultural vehicles, agricultural machinery or farm animals were included in the database.

Medical conditions
Fatalities attributed to pre-existing medical conditions (e.g., previous seizure or heart attack) were excluded from the fatality database. Fatalities where an agriculture-related injury (such as a fall from a machine) was immediately preceded by a significant medical event such as a stroke, seizure or heart attack, were also excluded. Fatalities from a heart attack where the victim was engaged in strenuous agriculture-related work at the time of or immediately before the heart attack are included in the fatality database as "overexertion".

Secondary complications
Fatalities that occurred in hospital from secondary complications of agriculture-related injuries (e.g., embolism, respiratory distress) were included in the fatality database. Note: New Brunswick does not identify these cases as farm-related if the fatality occurred more than two weeks after the agriculture-related injury.

Off-road vehicles
Fatalities involving off-road vehicles such as ATVs, dirt bikes, and dune buggies were included in the fatality database if they occurred on a farm or ranch and / or involved agriculture-related work.

Children at play
Fatalities of children who were playing in the agricultural workplace were included. For example, cases in which a person engaged in agriculture-related work was unable to supervise a child whom they had taken to the agricultural work place; cases where a child was killed as a direct result of someone engaged in an agriculture-related work activity; cases where a child was killed due to a hazard of the farm or ranch environment such as a riding horses, tending to farm animals, drowning in dugouts / sloughs or manure pit, etc.

APPENDIX B: GLOSSARY

GENERAL TERMS

Agriculture-related fatalities
CAIR defines an agriculture-related fatality as
1) Any unintentional injury resulting in a fatality that occurs during activities related to the operation of a farm or ranch in Canada and / or
2) Any unintentional injury resulting in fatality that involves any hazard of a farm or ranch environment in Canada (excluding fatal non-work-related injuries that take place in the farm residence). This includes fatalities that occur away from agricultural work locations if agriculture-related work is being done; e.g., transporting workers, livestock, supplies or harvested crops on public highways; farm animals roaming on public highways. Fatalities in which victims are killed because a third party is engaged in agriculture-related work are also included.

Denominator data
Data used as denominator values in rate calculations. If presented as a fraction, the lower half of an injury rate refers to the population exposed over a given period of time.

Farm
Any farm or other agricultural holding that produces at least one of the following agricultural products intended for sale: crops, livestock, poultry, animal products, greenhouse or nursery products, mushrooms, sod, honey, or maple syrup products. (Census of Agriculture, Statistics Canada.)

Injury
Damage to a person caused by an acute transfer of energy (mechanical, thermal, electrical, chemical, or radiation) or by the sudden absence of heat or oxygen.

Non-work hazards
Non-work hazards of the farm environment would include things that one wouldn't typically find in a "non-farm" residence. This would include; various locations such as dugouts / sloughs, orchards, wood lots, manure pits, various farm machinery such as tractors, combines, ploughs. It would also include various outbuildings such as barns, quonsets, chicken coops, and various activities of tending to animals, improper storage of equipment and riding of horses.

Numerator data
Data used as numerator values in rate calculations. If presented as a fraction, the top half of an injury rate refers to the number of cases (events) for a particular mechanism of injury and / or age group.

Runovers
Machine-related agriculture-related injuries were identified and coded by CAIR as "agriculture-related runovers" if the victim was runover, struck, or pinned by an upright vehicle or agricultural machine that was under power or rolling on an incline.

APPENDIX B: GLOSSARY

Alighted operator runover (subcategory of unmanned runover)
An operator is runover, pinned or struck by an unmanned machine under power or rolling on an incline, or by a machine or implement towed by it. Includes being runover while attempting to board a moving unmanned machine. Does not include cases where the decedent had been improperly starting the machine.

Activity prior to rollover
Included transportation of goods / livestock

- towing
- field work
- forestry
- working in the farm yard
- recreation, moving
- road maintenance
- extra rider
- unknown

Cause of rollover

- travelling too close to the edge
- travelling on an incline, cornering
- falling from a ramp
- carrying a heavy load in a bucket
- dragging logs / implements
- pulling stumps / trees
- towing
- collision with an object
- rough terrain
- tractor arms / bucket caught on ground
- pulling heavy machine / trailer
- unknown

Activity prior to entanglement
Maintenance / repairs / cleaning of equipment

Objects involved with injuries as a result of being pinned or struck by a machine or non-machine

- bale (large round)
- bale other
- tree, branch, log
- collapsing building or structure
- other heavy non-machine object example: gate or door
- heavy machine (not under power)
- truck box
- bucket
- front end loader arms
- other heavy machine component
- knife or blade
- baling or barbed wire
- tool or part of tool (includes power tools)
- hook, tow rope or chain
- hitch or tongue
- jacks or hydraulic lifts
- other non-machine object
- unknown
- other machine-related object

APPENDIX B: GLOSSARY

Bystander runover
A bystander is runover, pinned or struck by a manned machine, or by a machine or implement towed by it; includes being runover while attempting to board or alight from a moving manned machine.

Extra rider runover
A passenger falls from a machine and is then runover, pinned or struck by the machine, or by a machine or implement towed by it.

Improper start runover (subcategory of unmanned runover)
A person is runover by an unmanned machine subsequent to starting it by any means other than that specified by the machine's manufacturer. Includes bypass and jump starting.

Operator runover
An operator falls from a machine and is then runover, pinned or struck by the machine, or by a machine or implement towed by it.

Surveillance
The ongoing systematic collection, analysis, interpretation and dissemination of health data.

Unintentional injury
Unintentional injuries consist of that subset of injuries for which there is no evidence of predetermined intent. To further identify the activities or circumstances surrounding the leading causes of the fatalities, additional analysis was done based on the documentation in the circumstances text field of the abstract.

Unmanned runover
A person is runover, pinned or struck by an unmanned machine, or by a machine or implement towed by it. Includes being runover while attempting to board a moving unmanned machine.

APPENDIX C: ABSTRACTION FORM

CAIR'S AGRICULTURE-RELATED FATALITY DATA ABSTRACTION FORM

CAIR FATAL FARM INJURIES – DATA ABSTRACTION FORM

Coroner's File #: _____-_____ (year - no.)

CAIR ID: _____-_____-_____ (prov. - year - no.)

An Agricultural Fatality is: 1) Any unintentional injury resulting in death that occurred during activities related to the operation of a farm or ranch and/or 2) Any unintentional injury resulting in death that involved any hazard of a farm or ranch environment in Canada (excluding fatal non work-related injuries that took place in the farm residence). This includes deaths that occurred away from agricultural work locations if agricultural work was being done; e.g., transporting livestock, supplies, workers or harvested crops on public highways. Deaths where victims were killed because a third party was engaged in agricultural work are also included.

Age: _____ Birth Date: ____ / ____ / ____ (mm dd yyyy) Birth date missing (circle)? Yes No

Gender (circle): M F Province: _____ County/Regional Municipality: _____

Region: _____ Date of Injury: ____ / ____ / ____ (mm dd yyyy) Weekday of Injury (circle): S M T W T F S

Time of Injury _____ (24:00) Date of Death: ____ / ____ / ____ (mm dd yyyy)

Source of data for case identification (circle all that apply):

1 Coroner	2 Medical Examiner	3 Media
4 RCMP / police	5 Registrar General	6 Other

A. DESCRIPTION OF INJURY EVENT

Please include as many details as possible about the decedent's activity, task and location at the time of the incident. For falls and drownings, please describe exact location. For struck or pinned by object injuries, please specify object or machine component. For entanglements, please state whether clothing was involved. For tractor rollovers, please indicate whether the tractor had ROPS. For machine injuries, please describe the machine in as much detail as possible.

If the injury was not machinery or vehicle related, complete Section B and then proceed to Section E.
If the injury was machinery or vehicle related, begin with Section C and continue.

APPENDIX C: ABSTRACTION FORM

CAIR'S AGRICULTURE-RELATED FATALITY DATA ABSTRACTION FORM

B. CAUSE OF INJURY NOT MACHINERY OR VEHICLE RELATED

1 crushed or struck by animal. Specify animal: _____
2 other type of animal injury. Specify animal: _____
3 fall from animal. Specify animal: _____
4 struck by non-machine object
5 struck against non-machine object
6 caught inside, under or between non-machine objects
If 4 or 6, specify object: _____
7 fall from height. Give specific fall location: _____
8 fall on same level
9 jumped to lower level
10 overexertion
11 drowning
12 exposure to fire/explosion
13 contact with temperature extremes
14 contact with electric current
16 contact with radiation, caustic, toxic or noxious substance by (circle): inhalation ingestion absorption injection
Specify agent: _____
18 asphyxiation by grain or soil. Specify: _____
19 firearm
77 other non machine related. Specify: _____
88 unknown non machine related
99 not applicable

C. CAUSE OF INJURY MACHINERY OR VEHICLE RELATED

1 sideways rollover
2 backwards rollover
3 unspecified rollover
4 entangled/caught in machinery
5 pinned or struck by machine component or collapsing machine (specify)
6 traffic collision on road or highway
7 operator fell from moving machine, not runover, pinned, or struck by it
8 operator fell from moving machine, then runover, pinned, or struck by it
9 passenger fell from moving machine, not runover, pinned, or struck by it
10 passenger fell from moving machine, then runover, pinned, or struck by it
11 alighted operator/other person runover, pinned, or struck by unmanned machine
12 alighted passenger runover, pinned, or struck by moving machine
13 bystander runover, pinned, or struck by moving machine
14 machine-related contact with electrical current
15 machine related fire, explosion or burn
16 machine collision off-road
17 machine-related drowning
18 struck by object falling or propelled from machine (specify)
20 runover, pinned, or struck by moving machine - unspecified
77 other machine related. Specify: _____
88 unknown machine related
99 not applicable
If 5 or 18, specify object/component: _____

D. TYPE OF MACHINERY

(Circle appropriate number if the injury event was machinery or vehicle related)

1 tractor
2 auger. Specify whether freestanding, attached to machine, or unknown (circle)
3 mower
4 power take off, specify machine PTO attached to: _____
5 baler
6 farm wagon/trailer
7 combine
8 power tool (not chainsaw)
9 chainsaw
10 welder
11 harvester
12 plough/disk
13 hay elevator
14 manure spreader
15 bulldozer, bob cat, skid steer
16 motor vehicle. Specify: _____
17 off-road vehicle. Specify: _____
19 fencing equipment
20 spraying equipment
22 garden equipment
24 planting equipment
25 swather
26 rock picker
27 snow blower
28 airplane
77 other farm implement/machine. Specify: _____
88 unknown
99 not applicable

E. IMMEDIATE LOCATION OF INJURY

1 Field (includes dry ditches next to field)
2 Barn
3 Silo/grain bin, (circle)
4 Shed
5 Farmyard
6 Road/highway (includes dry ditches)
7 Driveway (includes dry ditches)
8 Farm house
9 Farm road (includes dry ditches)
10 Woods, orchard
11 Water source; includes water-filled ditch, dugout, manure lagoon, sewage pit, etc. Specify: _____
12 Corral/outdoor animal enclosure
13 Other unspecified ditch/embankment/dyke
14 Trench
77 Other location. Specify: _____
88 Unknown

F. LOCATION OF DEATH

1 Found dead
2 Died *en route*
3 Died in hospital
77 Other location of death. Specify: _____
88 Unknown

G. RELATIONSHIP OF INJURED PERSON TO FARM OWNER/OPERATOR

1 Operator
2 Spouse of farm operator
3 Child of farm operator
4 Other relative of farm operator. Specify: _____
5 Hired worker
6 Spouse of hired worker
7 Child of hired worker
8 Other relative of hired worker. Specify: _____
9 Other non-visiting child
10 Other non-visiting adult
11 Adult visitor or contractor
12 Child visitor
77 Other relationship. Specify: _____
88 Unknown

H. METHOD OF DISCOVERY

Who found the deceased? (i.e. relationship to deceased) _____

Was the injury event witnessed? (circle) Y N

(Indicate if the information is not available)

I. NATURE OF INJURY BY BODY PART

e.g., NI1 crush injury, BP1 chest.
(List from most to least serious injury, where the most serious injury was the cause of death.)

Nature of injury 1: _____
Body part 1: _____
Nature of injury 2: _____
Body part 2: _____

J. ALCOHOL INVOLEMENT (effective 2012 date of death)

Was alcohol involved? Y N If yes, was the deceased tested for alcohol? Y N

If yes, was the test positive for alcohol? Y N If yes, what was the alcohol level? _____

If yes, is this greater than the legal provincial level? Y N

APPENDIX D: AGRICULTURE POPULATIONS

CANADIAN FARM POPULATIONS BY AGE GROUP AND YEAR (including temporary foreign workers)

Age Group	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
1-4 yrs	74,754	71,847	68,936	66,027	63,120	60,209	57,300	54,391	51,482	48,573
5-9 yrs	96,006	92,752	89,494	86,238	82,982	79,726	76,470	73,214	69,958	66,702
10-14 yrs	110,863	107,555	104,247	100,941	97,631	94,323	91,015	87,707	84,399	81,091
15-19 yrs	100,488	98,313	96,112	93,939	91,763	89,576	87,405	85,227	83,049	80,879
20-24 yrs	61,313	59,583	57,822	56,174	54,505	52,860	51,094	49,481	47,980	46,537
25-29 yrs	56,547	53,913	51,145	48,863	46,489	44,217	41,804	39,599	37,840	36,041
30-39 yrs	192,328	183,965	175,541	167,405	159,156	151,260	143,132	135,344	127,594	120,066
40-49 yrs	170,237	168,251	166,060	164,069	162,135	160,173	158,403	156,805	154,834	152,877
50-59 yrs	124,313	124,133	123,992	123,870	123,780	123,686	123,666	123,692	123,519	123,392
60-69 yrs	97,327	95,579	93,526	91,487	89,430	87,384	85,331	83,293	81,242	79,189
70-79 yrs	36,981	36,944	36,899	36,858	36,817	36,776	36,735	36,694	36,653	36,615
>80 yrs	8,252	8,335	8,418	8,501	8,586	8,667	8,751	8,835	8,919	9,003
TOTAL	1,129,709	1,101,170	1,072,192	1,044,372	1,016,396	988,857	961,107	934,284	907,472	880,969

Age Group	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
1-4 yrs	45,664	42,755	40,997	39,239	37,481	35,723	33,965	33,207	32,449	31,691
5-9 yrs	63,446	60,190	57,152	54,114	51,076	48,038	45,000	43,480	41,960	40,440
10-14 yrs	77,783	74,475	71,739	69,003	66,267	63,531	60,795	58,109	55,423	52,737
15-19 yrs	78,701	76,515	75,056	73,592	72,136	70,679	69,237	66,365	63,519	60,623
20-24 yrs	45,256	43,763	43,200	42,642	42,092	41,579	41,198	40,294	39,305	38,180
25-29 yrs	34,206	32,326	31,569	30,787	29,836	29,142	28,399	27,666	26,988	25,728
30-39 yrs	112,260	104,717	98,818	92,725	86,898	81,476	75,738	73,713	72,284	69,442
40-49 yrs	151,231	149,810	147,063	144,534	142,055	139,854	137,485	130,935	124,563	117,741
50-59 yrs	123,246	123,188	124,627	126,118	127,617	129,106	130,642	130,761	130,938	131,085
60-69 yrs	77,146	75,105	76,181	77,279	78,375	79,493	80,576	82,372	84,196	85,972
70-79 yrs	36,574	36,530	37,107	37,681	38,255	38,829	39,403	39,869	40,336	40,797
>80 yrs	9,087	9,171	9,751	10,331	10,911	11,491	12,071	12,235	12,399	12,563
TOTAL	854,605	828,551	813,267	798,053	783,008	768,951	754,520	739,018	724,373	707,013

Age Group	2010	2011	2012	2013	2014 *	2015 *	2016 +	2017 *	2018 *	2019 *	2020 *
1-4 yrs	30,933	30,175	30,032	29,889	27,370	27,220	24,670	26,920	26,770	26,620	26,470
5-9 yrs	38,920	37,400	36,736	36,072	32,366	31,738	28,380	30,482	29,854	29,226	28,598
10-14 yrs	50,051	47,365	45,322	43,279	37,410	35,490	30,605	31,650	29,730	27,810	25,890
15-19 yrs	57,735	54,869	52,383	49,904	42,889	40,695	35,100	36,315	34,125	31,933	29,740
20-24 yrs	37,128	36,081	35,612	35,271	31,336	30,752	27,845	29,813	29,881	29,505	29,129
25-29 yrs	24,832	23,849	24,272	24,942	23,384	23,364	21,660	23,431	25,502	25,971	26,441
30-39 yrs	67,245	65,071	65,069	65,557	61,047	60,934	58,115	62,036	61,877	62,066	62,254
40-49 yrs	111,104	104,732	99,855	95,066	82,990	78,572	69,405	70,103	65,951	61,732	57,513
50-59 yrs	131,347	131,702	129,487	127,317	113,660	111,988	101,355	108,567	106,669	104,898	103,127
60-69 yrs	87,784	89,606	90,581	91,566	82,349	83,275	77,790	85,255	86,200	87,144	88,088
70-79 yrs	41,266	41,730	42,344	42,958	38,658	39,289	36,945	40,561	41,187	41,820	42,452
>80 yrs	12,727	12,891	13,098	13,305	11,776	12,001	11,570	12,489	12,733	12,977	13,221
TOTAL	691,087	675,487	664,808	655,144	585,254	575,318	523,440	557,622	550,479	541,701	532,923

*= British Columbia populations excluded
+= Manitoba and British Columbia populations excluded

APPENDIX D: AGRICULTURE POPULATIONS

PERCENT CHANGE IN CANADIAN FARM POPULATIONS BY AGE GROUP AND YEAR

(excludes temporary foreign workers)

Age Group	1990	2020	1990 - 2020 Difference	% Change 1990 - 2020
1-4 yrs	74,754	28,888	-45,866	-61
5-9 yrs	96,006	31,424	-64,582	-67
10-14 yrs	110,863	28,978	-81,885	-74
15-19 yrs	100,463	32,526	-67,937	-68
20-24 yrs	60,577	31,304	-29,273	-48
25-29 yrs	53,379	24,794	-28,585	-54
30-39 yrs	187,401	53,325	-134,076	-72
40-49 yrs	167,794	49,162	-118,632	-71
50-59 yrs	123,970	106,886	-17,084	-14
60-69 yrs	97,613	97,758	145	0
70-79 yrs	36,981	47,246	10,265	28
>80 yrs	8,252	14,729	6,477	78
TOTAL	1,118,053	547,020	-571,033	-51

From 1990 – 2020, the overall Canadian agriculture population decreased by 51%. However, there has been an increase in the older population. Those 80 years and older experienced the largest percent increase with 78%. Those 70 to 79 years of age experienced a 28% increase. The largest decrease in population was experienced by those 10 to 14 years of age with a reduction of 74%. This is followed by those 30 to 39 years of age with a 72% reduction.

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