



The Canadian Agricultural Injury Surveillance Program

Summary report on agricultural injuries in Canada due to being entangled, pinned, or struck by machinery, 1990-2000

Entanglements occur when any part of the body is pulled into or wrapped around moving machinery, such as power-take-off devices (PTOs), balers, augers, combines and hay or grain elevators.

Common factors leading to injury include:

- Wearing loose clothing while working with or near an entanglement hazard.
- Cleaning or maintaining a machine while it is still running.
- Stepping over a PTO or conveyor belt.
- Using a machine that has missing or defective guards.

Injuries from being pinned or struck by machinery differ in severity depending upon the circumstances. If the victim is crushed by a heavy machine or machine component because of a jack collapse or hydraulic failure, the injury is usually fatal. Hospitalized injuries due to being pinned or struck by machinery are most commonly associated with minor tractor collisions, improper hitching of ploughs and wagons, and routine tasks involving post pounders, augers, balers and power tools.

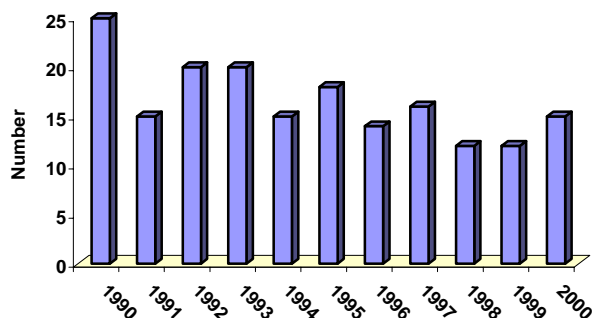
Common factors leading to injury include:

- Blocking not being used and brakes not set while working under a vehicle or machine.
- Blocking not being used while working under a heavy machine component supported by a hydraulic system or pins, such as a truck box, front-end loader (FEL) arms, or bucket.
- Operating a tractor where there is insufficient clearance to maneuver safely.
- Hitching while parked on a slope; failure to use blocking and brakes while hitching.

Number of agricultural entanglements and pinned or struck by machinery injuries in Canada from 1990-2000

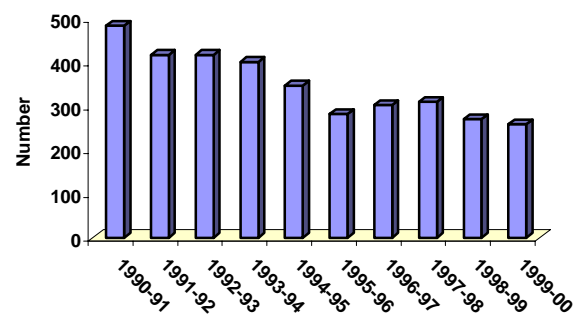
Fatal injuries

Machine entanglements and being pinned or struck by machinery were the 3rd most frequent cause of death on Canadian farms and ranches from 1990-2000. Together, the 109 fatal entanglements and 73 fatal injuries from being pinned or struck by machinery accounted for 14.4% of all agricultural fatalities.



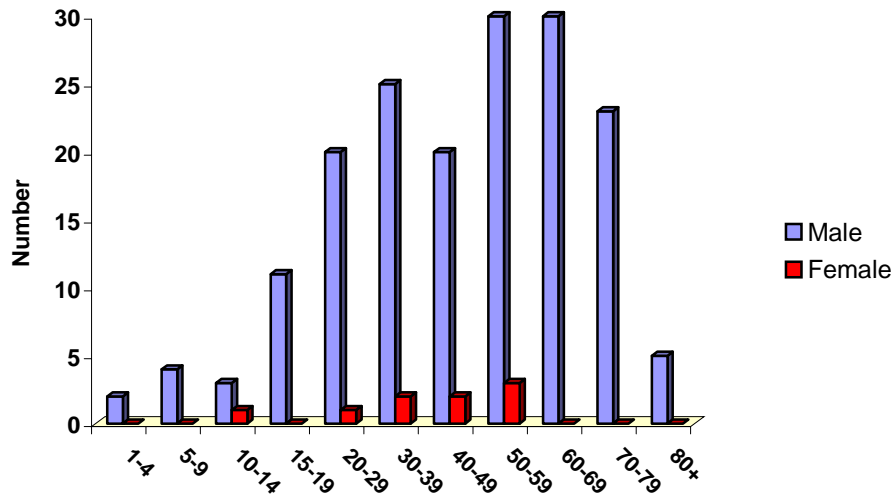
Injuries requiring hospitalization

Machine entanglements and being pinned or struck by machinery were the **leading** cause of hospitalized injuries on Canadian farms and ranches from 1990-2000. The 2311 entanglements and 1025 injuries from being pinned or struck by machinery were responsible for 22.5% of all agricultural hospitalizations.



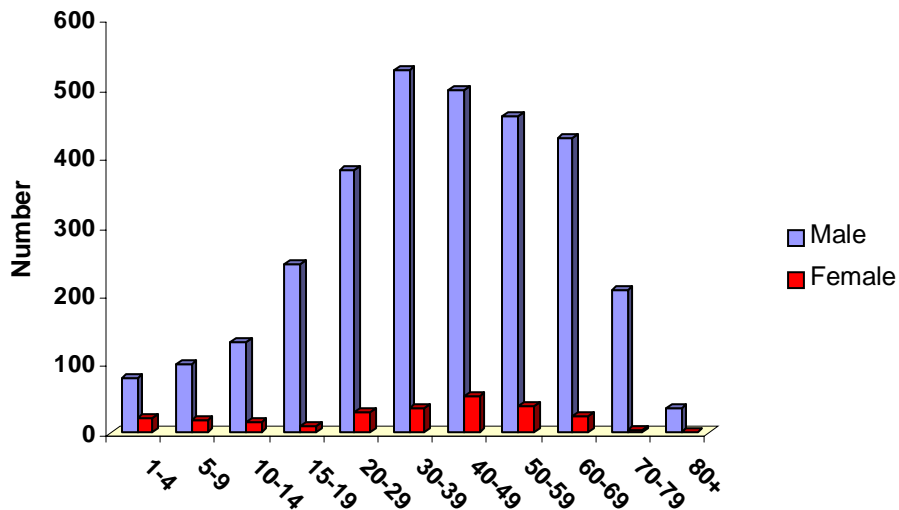
Agricultural entanglements and pinned or struck by machinery injuries in Canada by age category and gender, 1990-2000

Fatal injuries



- 95.1% of the victims who were fatally entangled, pinned, or struck by machinery were male.
- Machine entanglement and being pinned or struck by machinery are prominent causes of fatal injury in working males from age 20 to 80.

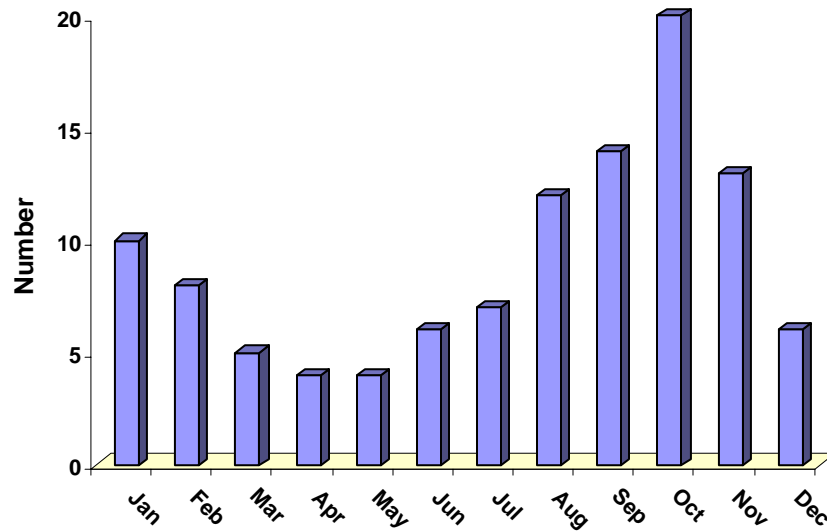
Injuries requiring hospitalization



- The pattern of injury occurrence by age and gender is similar for both fatal and hospitalized injuries.
- From 1990 to 2000, six children under age ten and were killed and 223 were hospitalized because they were entangled, pinned or struck by machinery.
- Strategies should be implemented to prevent farm children from losing their lives or limbs because of these types of injuries. The most effective means of preventing entanglement and pinned or struck by machinery injuries in young children is to keep them away from the agricultural worksite.

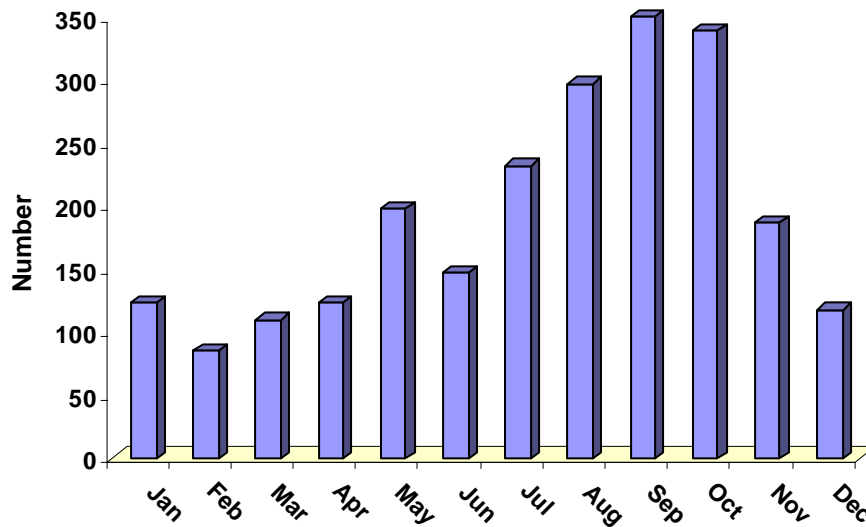
Agricultural entanglements in Canada by month of injury occurrence, 1990-2000

Fatal injuries



- Loose clothing is the “lead point” in the majority of fatal entanglement injuries. Entanglement deaths are most frequent from September to November, when cooler weather results in more workers operating augers and PTOs while wearing loose jackets, sweaters and coats. Workers should always wear tight-fitting clothing when operating machinery of any kind.

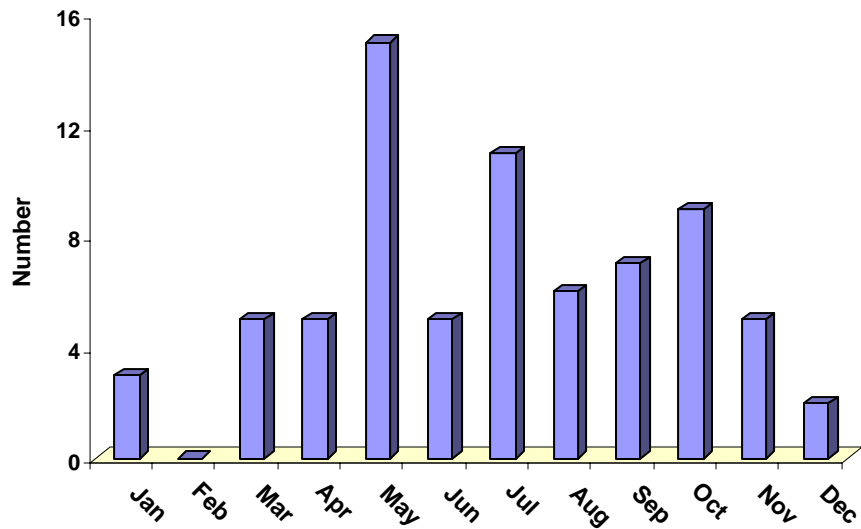
Injuries requiring hospitalization



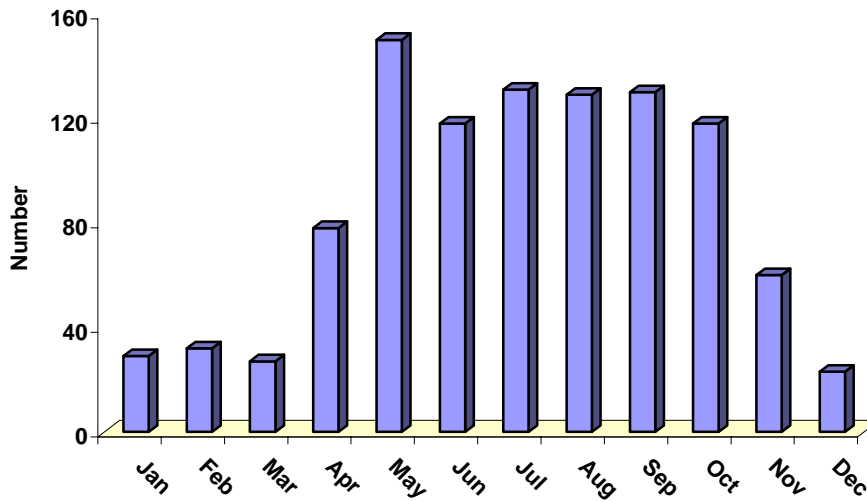
- Entanglement injuries requiring hospitalization were most common in the late summer and early fall.

Agricultural pinned or struck by machinery injuries in Canada by month of injury occurrence, 1990-2000

Fatal injuries



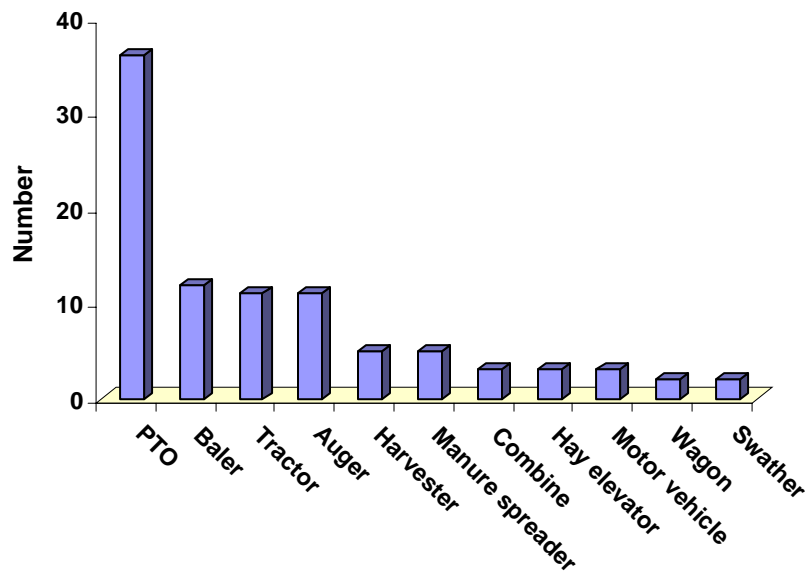
Injuries requiring hospitalization



- Injuries from being pinned or struck by machinery occurred throughout the active farming season.

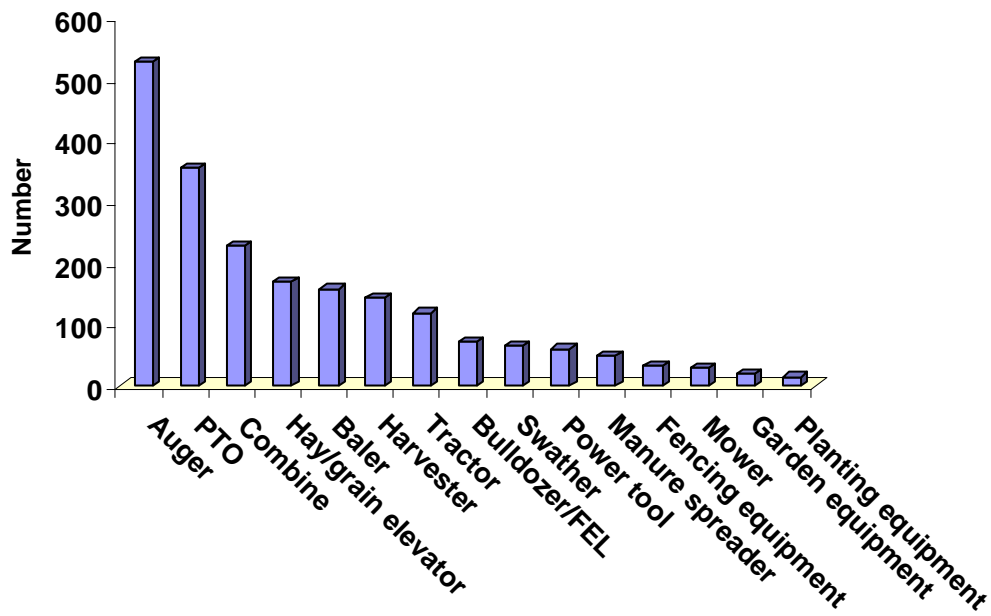
Agricultural entanglement injuries in Canada by type of machine, 1990-2000*

Fatal injuries



- 33% of entanglement fatalities were caused by PTOs. The power and speed of PTOs combine to make them the most lethal piece of farm equipment involved in entanglement injuries.

Injuries requiring hospitalization

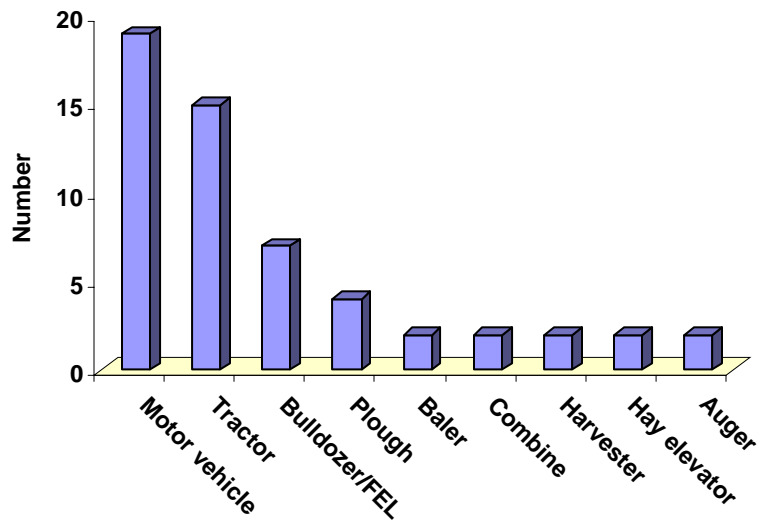


- 22.9% of hospitalized entanglement injuries were due to augers.
- Most entanglement injuries resulted in partial or complete amputations.

*For fatal cases, the chart includes machine types that were identified for two or more fatalities. For hospitalized cases, the chart includes only the leading fifteen machine types.

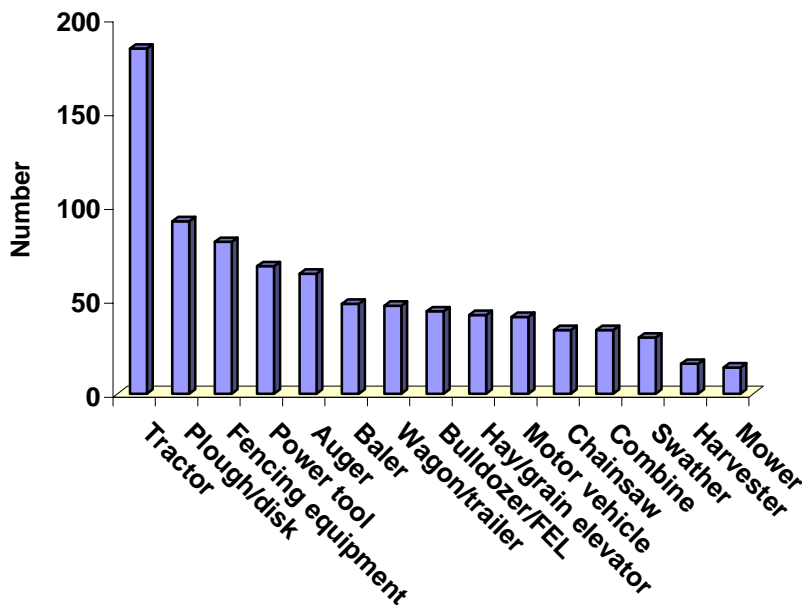
*Agricultural pinned or struck by machine injuries in Canada by type of machine,
1990-2000**

Fatal injuries



- 26% of pinned or struck by machinery fatalities involved motor vehicles.
- 26% of motor vehicle pinned or struck by machinery fatalities were associated with jack or hoist collapse during vehicle maintenance. 42% were due to truck box collapse because of hydraulic failure.
- 82% of pinned or struck by machinery fatalities involving tractors and bulldozers/FELs were due to breakage of bucket pins or hydraulic failure, causing the victim to be struck by a collapsing bucket or FEL arms.

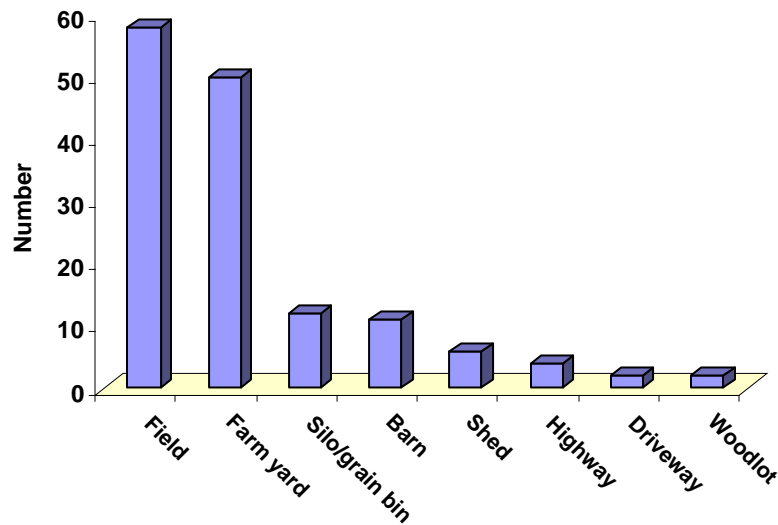
Injuries requiring hospitalization



- 26.9% of hospitalized pinned or struck by machinery injuries involved tractors or ploughs, 7.9% were due to post pounders, and 6.6% were caused by power tools.

*For fatal cases, the chart includes machine types that were identified for two or more fatalities. For hospitalized cases, the chart includes only the leading fifteen machine types.

*Fatal agricultural entanglements and pinned or struck by machine injuries in Canada by location of occurrence, 1990-2000**



- Fatal entanglements and pinned or struck by machinery injuries most frequently occurred in fields or farmyards.

*This chart includes only locations that were identified for two or more fatalities.

Prevention measures for entanglements and pinned or struck by machinery injuries:

- *Wear tight fitting clothing, such as overalls, whenever working with or near machinery.*
- *Avoid wearing any items that could easily become entangled, such as long coats or scarves.*
- *Before operating any machine or power tool, ensure that all guards are in place and in good condition.*
- *Never perform maintenance on a machine or attempt to clear an obstruction while the machine is still running.*
- *Before activating a machine, make certain that all co-workers and bystanders are at a safe distance from any moving parts.*
- *Never step over a PTO shaft or conveyor belt.*
- *When conducting maintenance on a vehicle or machine, ensure that the engine is turned off, the brakes are set and that appropriate blocking is in place which would support the vehicle, machine, or machine part in the event of a jack, hoist, pin or hydraulic failure.*
- *Keep hydraulic systems well maintained and inspect bucket pins regularly.*
- *If you must place any part of your body under a heavy machine component that is supported by a hydraulic system or by pins, such as a truck box, FEL arms, or a bucket attachment, always use appropriate blocking.*
- *Stay well away from vehicles or machines that are being operated on ramps or steep inclines.*
- *Keep young children out of the farm or ranch work site, especially areas where there is moving machinery.*
- *When assigning work to teenagers, follow the North American Guidelines for Children's Agricultural Tasks. These can be downloaded from: http://www.nagcat.org/nagcat/pages/default.aspx?page=nagcat_guidelines.*
- *Ensure that anyone working with augers, PTOs and other extremely hazardous machinery receives appropriate safety instructions and adequate supervision.*