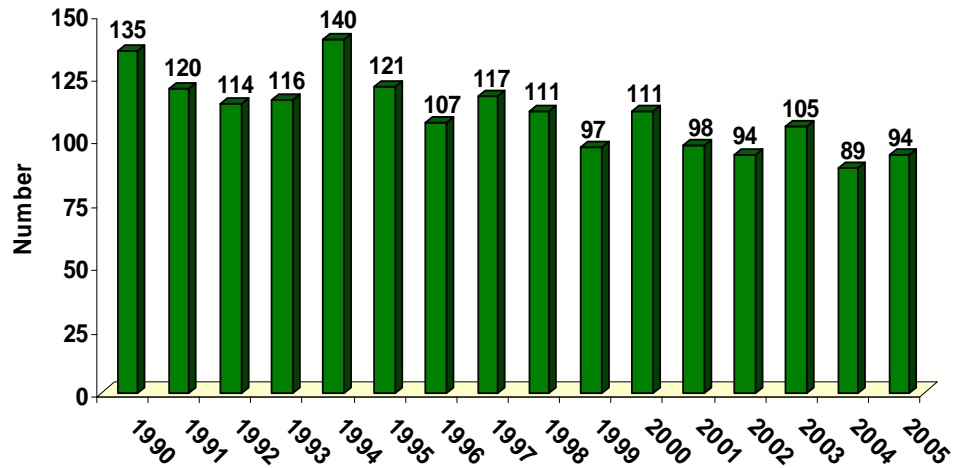


3 AGRICULTURAL FATALITIES IN CANADA 1990-2005: OVERVIEW

3.1 Fatal agricultural injuries by calendar year, 1990-2005

From 1990 to 2005, there were 1,769 agricultural fatalities in Canada. (An average of about 110.6 deaths per year). The peak year for fatalities was 1994, with 140 cases (7.9% of the total number of cases). During the first eight years of the surveillance period, there were seven years with a higher than average number of cases, whereas in the last eight years of the surveillance period there were only two years with higher than average numbers of cases (1998 and 2000).

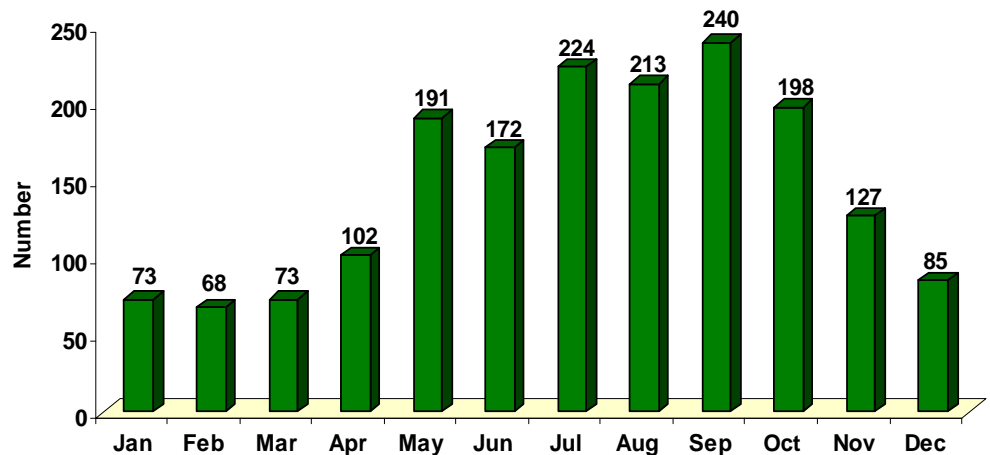


3.2 Fatal agricultural injuries by month, 1990-2005

70.1% of all agricultural fatalities in Canada occurred from May to October.

The highest proportion of fatalities took place in September (13.6%). Another 12.7% of the deaths were in the month of July and 12.1% in the month of August.

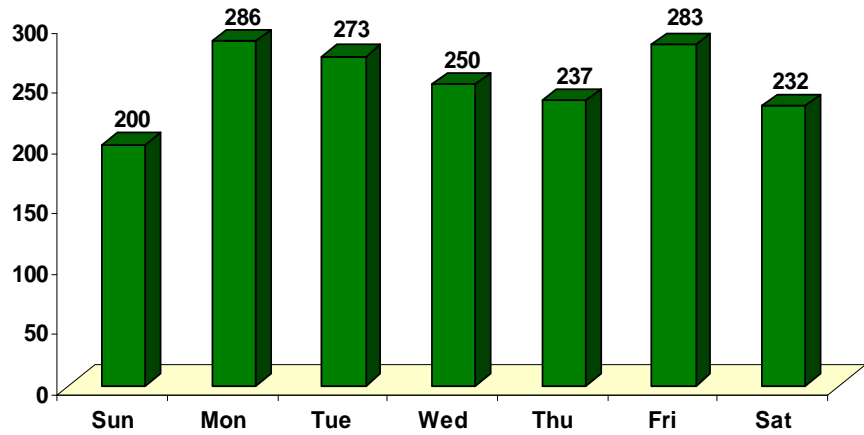
Relatively few fatal agricultural injuries occurred in the winter months of December to March.



3.3 Fatal agricultural injuries by weekday, 1990-2005

Fewer agricultural fatalities occurred on Sundays (11.4%) than on any other day of the week.

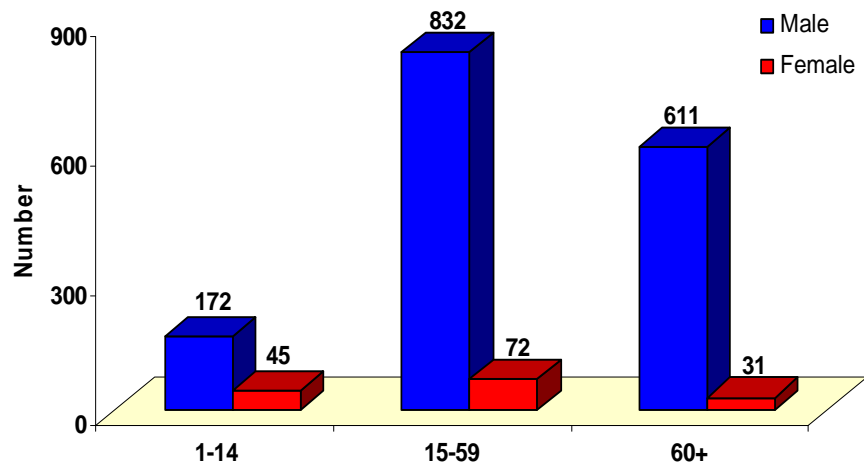
More fatalities tended to occur on non-weekend days, ranging from a low of 14.2% (Wednesdays) to a high of 16.2% (Mondays).



Weekday was not available for eight cases.

3.4a Fatal agricultural injuries by age group and gender, 1990-2005

91.6% of the persons who died in agricultural injury events were male. The ratio of males to females was highest for the 60+ age group (19.7:1), and lowest for the 1-14 year age group (3.8:1).



3.4b Fatal agricultural injuries by age group and gender, 1990-2005

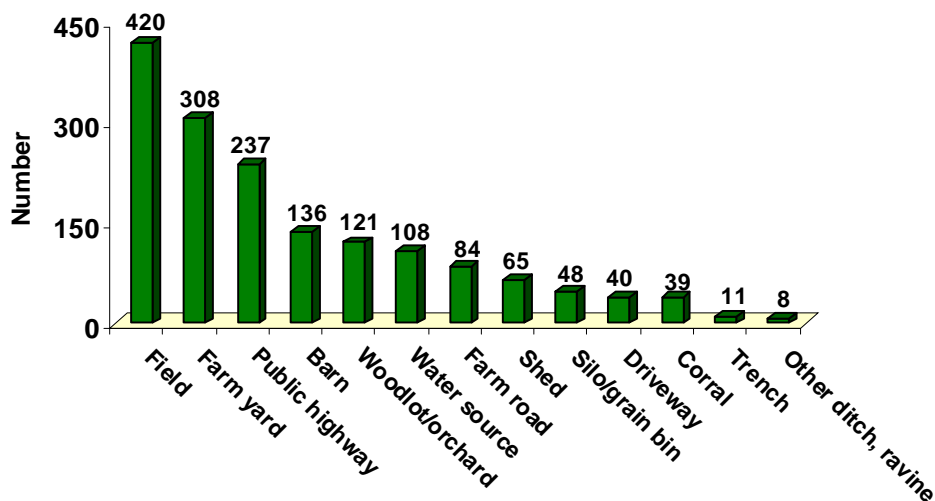
The majority of those fatally injured were in the 15 to 59 age group (51.3%). Larger numbers of children and older adults were killed than would have been expected given their representation in the farm population.

Age group	1-14	15-59	60+	Total	Percent
Male*	172	832	611	1621	91.6
Female	45	72	31	148	8.4
Total	217	904	642		
Percent	12.3	51.3	36.4		

*Age was not known for six males

3.5 Fatal agricultural injuries by location of injury occurrence, 1990-2005

The most common locations of injury for agricultural fatalities in Canada were fields and their adjacent ditches (25.8%), farm yards (19.0%), public roads and their adjacent ditches (14.6%), and barns (8.4%).



Location was not known in 106 cases.

3.6 Fatal agricultural injuries: population numbers and fatality rates by age category and gender, 1990-2005

BOTH GENDERS	Farm population*	Percentage of population	Number of fatal injuries	Percentage of all fatal injuries**	Age specific fatality rate/ 100,000/year^
1-4	43,315	5.1	99	5.6	14.3
5-9	71,035	8.4	67	3.8	5.9
10-14	84,025	10.0	51	2.9	3.8
15-19	80,455	9.5	89	5.0	6.9
20-29	80,775	9.6	135	7.7	10.4
30-39	121,230	14.4	185	10.5	9.5
40-49	139,425	16.5	226	12.8	10.1
50-59	110,135	13.1	269	15.3	15.3
60-69	73,620	8.7	279	15.8	23.7
70-79	30,825	3.7	246	14.0	49.9
80+	7,755	0.9	117	6.6	94.3
Total:	842,595	100.0	1763¹	100.0	13.7

MALES	Farm population*	Percentage of population	Number of fatal injuries	Percentage of all fatal injuries**	Age specific fatality rate/ 100,000/year^
1-4	22,420	5.0	78	4.8	21.7
5-9	36,415	8.1	50	3.1	8.6
10-14	43,415	9.7	44	2.7	6.3
15-19	42,760	9.5	80	5.0	11.7
20-29	45,645	10.2	126	7.8	17.3
30-39	60,910	13.6	167	10.3	17.1
40-49	72,100	16.1	212	13.1	18.4
50-59	58,685	13.1	247	15.3	26.3
60-69	42,870	9.6	266	16.5	38.8
70-79	18,690	4.2	233	14.4	77.9
80+	4,090	0.9	112	6.9	171.1
Total:	448,000	100.0	1615¹	100.0	22.6

FEMALES	Farm population*	Percentage of population	Number of fatal injuries	Percentage of all fatal injuries**	Age specific fatality rate/ 100,000/year
1-4	20,895	5.3	21	14.2	6.3
5-9	34,620	8.8	17	11.5	3.1
10-14	40,600	10.3	7	4.7	1.1
15-19	37,695	9.6	9	6.1	1.5
20-29	35,130	8.9	9	6.1	1.6
30-39	60,320	15.3	18	12.2	1.9
40-49	67,325	17.1	14	9.5	1.3
50-59	51,455	13.0	22	14.9	2.7
60-69	30,750	7.8	13	8.8	2.6
70-79	12,135	3.1	13	8.8	6.7
80+	3,665	0.9	5	3.4	8.5
Total:	394,590	100.0	148	100	2.3

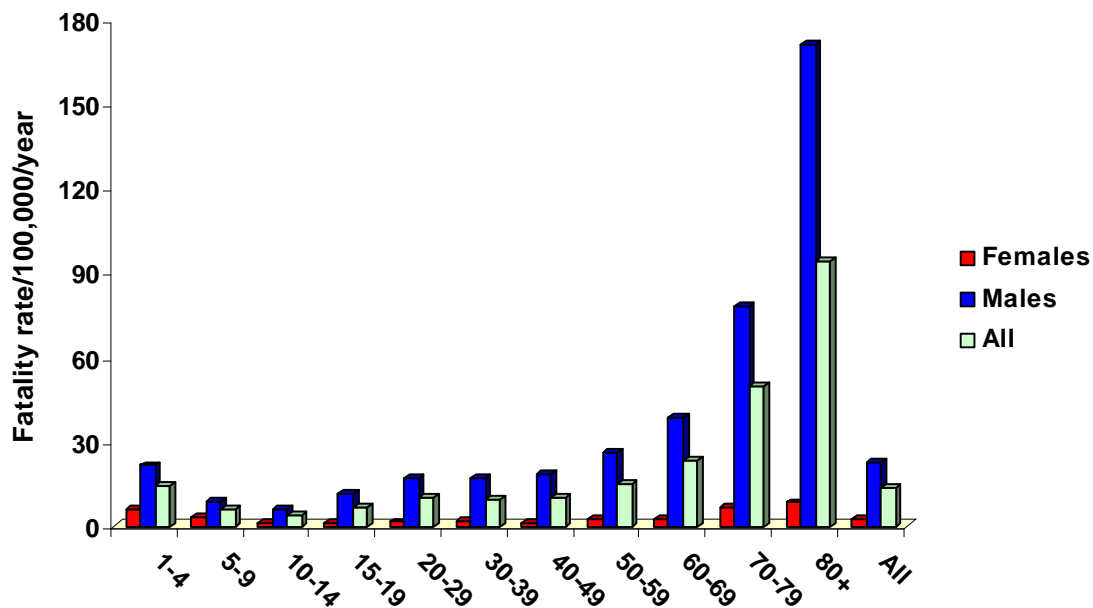
¹ Age was unknown in 6 cases

* Statistics Canada, Census of Agriculture 1996

**The over represented groups are highlighted

^The top five rates are highlighted

3.7 Agricultural fatality rates by gender and age category, 1990-2005



For both genders combined as well as males only, fatal agricultural injuries were most frequent for children aged 1-4 and for adults aged 50 and over. Overall, children aged 1-4 and adults in the older age groups (50-80+) were over-represented as victims of fatal agricultural injury events relative to their proportion of the farm population. This was especially true for older adults. The percentage of adults aged 80+ who were killed was 7.3 times the percentage of adults that age in the Canada farm population. Considering males only, the percentage of adults 80+ who were killed during agricultural work was 7.7 times the percentage of male adults that age in the farm population. In females, the pattern was slightly different. Children under ten and adults aged 50 and over were over-represented as victims of fatal agricultural injury events relative to their proportion of the female farm population. This was especially true for girls under five years old and women over age 70. The percentage of preschool girls killed was 2.7 times the percentage of girls under five in the farm population. The percentage of women 70 and over who were fatally injured was 3.1 times the percentage of women that age in the farm population.

In males, fatality rates showed a marked bimodal distribution with age. There was a very high fatality rate for boys under five (21.7/100,000/year), and extraordinarily high rates for males aged 60 and over. Within every age group, the fatality rate for males was higher than for females.

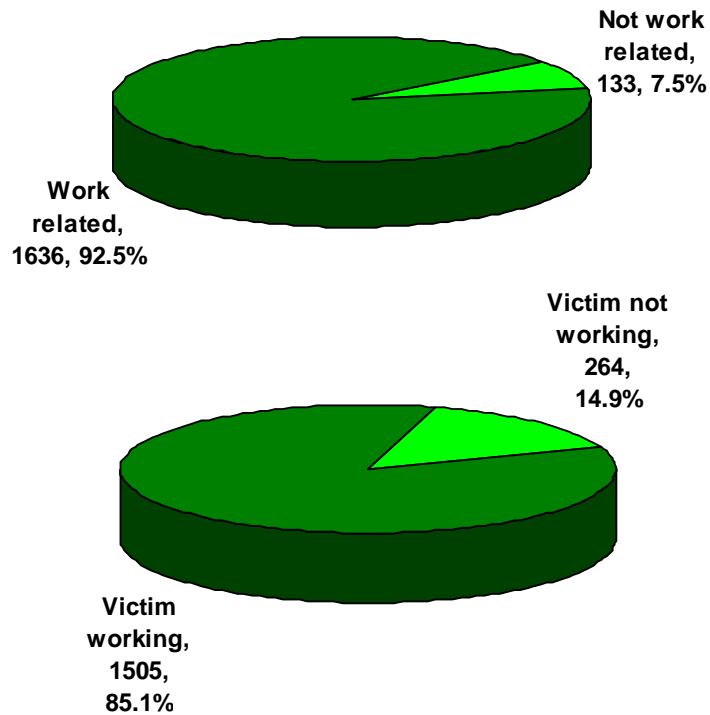
The high rates of death among very young children are likely due to their easy and often unsupervised access to very dangerous work areas where many bystander runovers occur. They are also heavily exposed to hazards of the farm environment such as dugouts, manure pits and improperly secured heavy objects. In addition, taking young children as extra riders on machinery results in many runover fatalities.

The extremely high rates of death among elderly males reflect their active participation in long hours of difficult and dangerous machine-related farm work well into their eighties, in spite of increasing physical limitations. The incidence of unmanned machine runovers, fallen operator runovers, falls from machines and machine rollovers is extremely high in this age group.

3.8 Fatal agricultural injuries: the relationship to agricultural work, 1990-2005

92.5% of the agricultural fatalities in Canada were work related. The few deaths that were not work related (7.5%) were due to hazards of the farm environment.

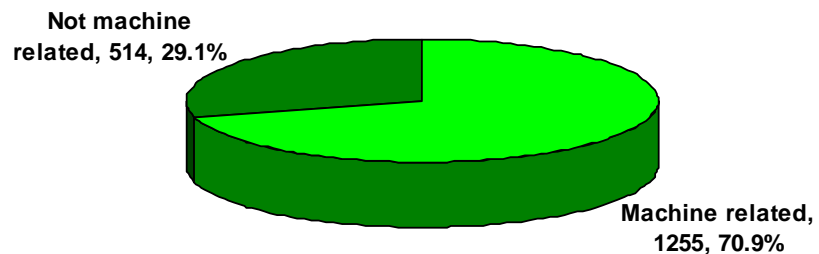
Most adults who died were engaged in agricultural work, whereas the majority of children who were killed in work-related injury events were not working themselves. Overall, 85.1% of those killed in agricultural injury events were actually engaged in agricultural work.



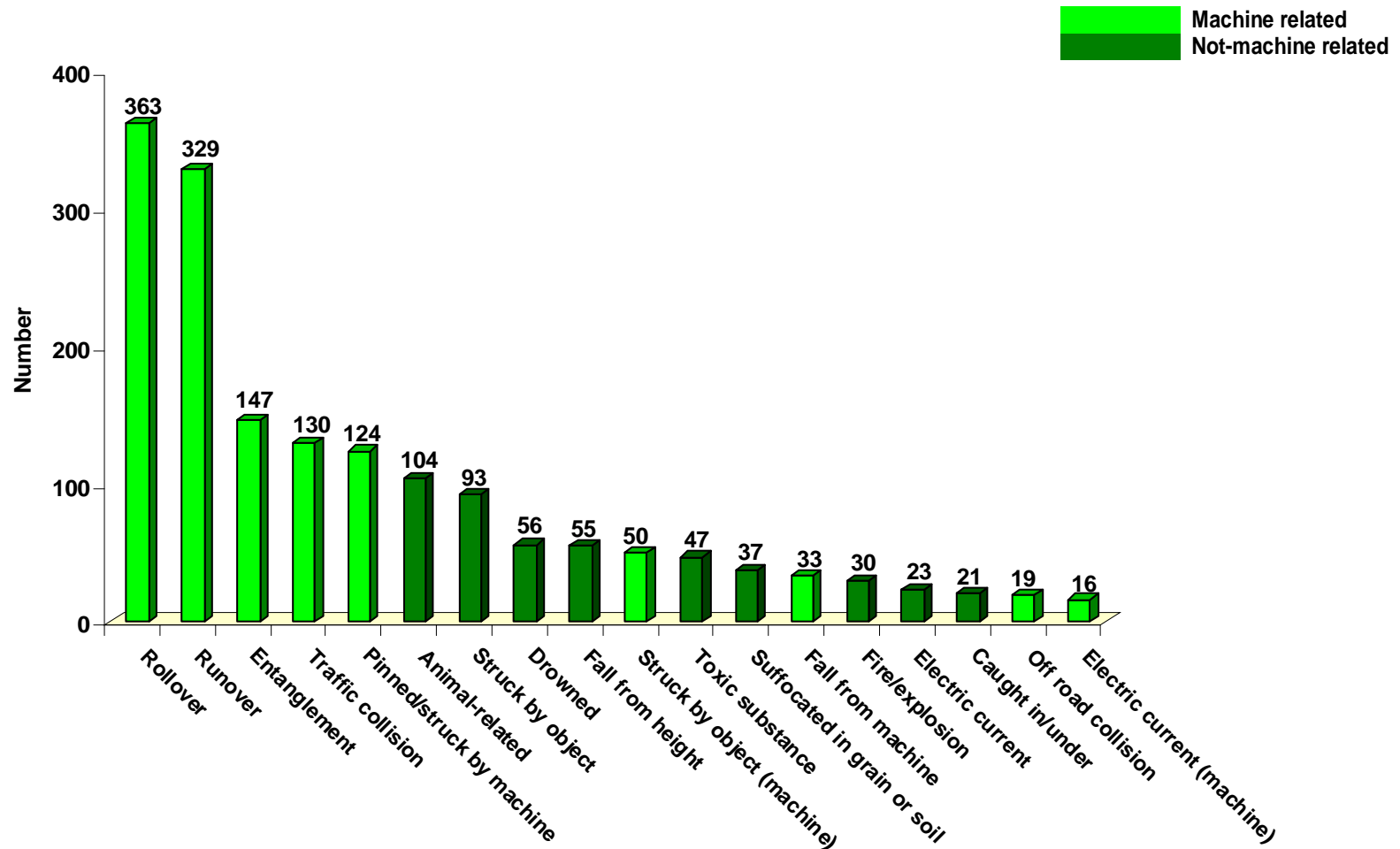
3.9 Fatal agricultural injuries by major cause, 1990-2005

70.9% (1,255) of agricultural fatalities were machine related. The leading machine-related mechanisms of fatal injury were machine rollovers, machine runovers and machine entanglements. (Figure 3.10).

The 514 agricultural fatalities that were not machine related (29.1%) included being struck by an animal or an object, drownings (mainly in children), falls from height, and exposure to toxic substances. (Figure 3.10).



3.10 Fatal agricultural injuries by cause of injury*, 1990-2005



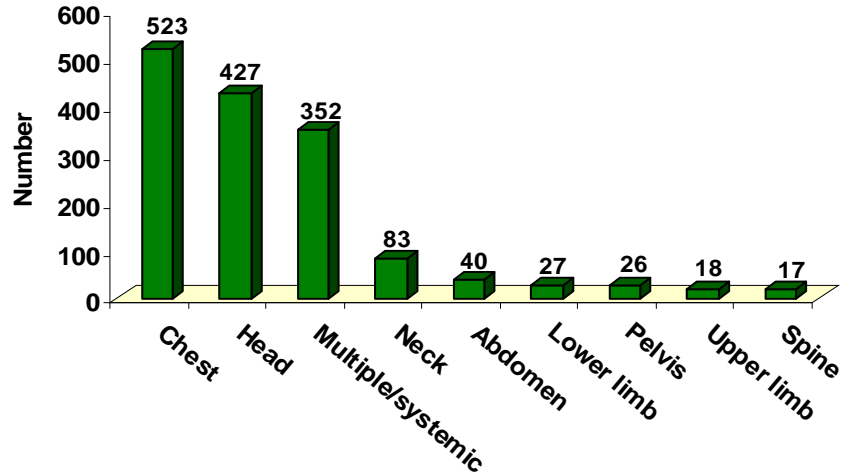
Almost half of all agricultural fatalities in Canada (47.4%) were due to three machine-related causes: machine rollovers, machine runovers and machine entanglements. Over all age groups, the leading causes of agricultural fatalities in Canada were machine rollovers (20.5%), machine runovers (18.6%), machine entanglements (8.3%), traffic collisions (7.3%), being pinned or struck by a machine (7.0%), animal-related events (5.9%) and being struck by a non-machine object (5.3%).

Another 44 machine-related and 48 non machine related cases with less than fifteen fatalities per cause of injury were not included in the above figure.

3.11 Fatal agricultural injuries by body part injured, 1990-2005

Where the primary nature of injury was known, the chest was cited as the body part involved in 34.6% of the injuries that most probably caused death. In 28.2% of the fatalities, the head was the most severely injured body part.

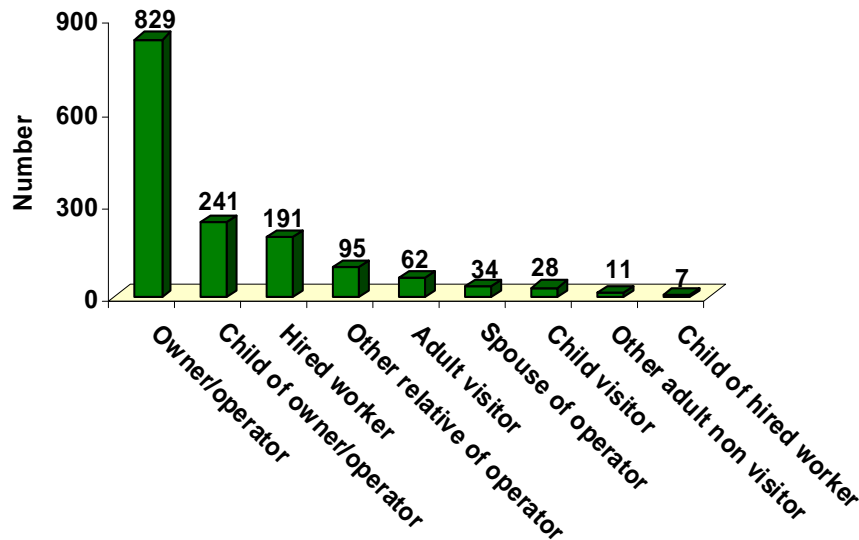
23.3% of the deaths involved injuries to multiple body parts (such as severe crush injuries and extensive burns), or systemic injuries like poisonings or suffocations.



The body part involved in the most important injury ('nature of injury 1') was not known in 256 cases.

3.12 Fatal agricultural injuries by relationship to farm operator, 1990-2005

Of the cases where the relationship between the victim and the farm operator was known, 55.3% of the persons killed in agricultural injury events were farm operators. A further 16.1% of the victims were children of farm operators and 12.8% were hired workers. Only 6.0% of those fatally injured were visitors or contractors.

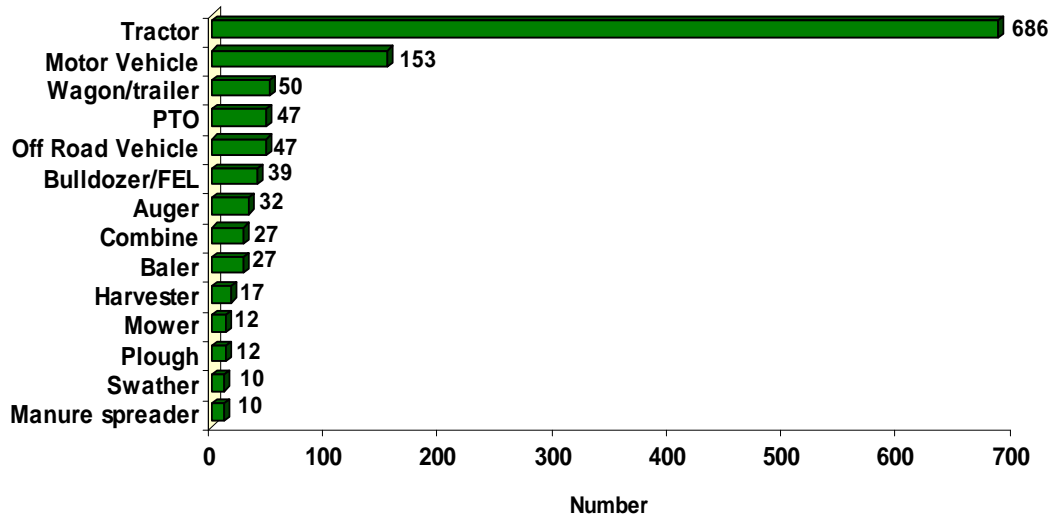


Relationship was cited as 'other' or 'unknown' in 271 cases.

3.13 Fatal machine-related agricultural injuries by machine type, 1990-2005

There were 1,255 machine-related agricultural fatalities in Canada from 1990 to 2005. Machine types most frequently involved in agricultural fatalities were tractors (54.7%), followed by motor vehicles (12.2%), wagons and trailers (4.0%), power take offs (3.7%), and off road vehicles (3.7%).

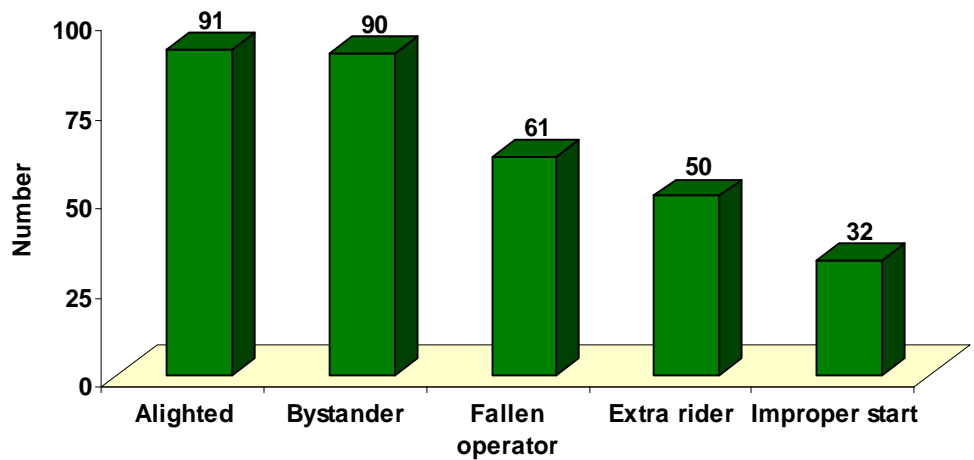
Tractors were associated with 38.8% of all agricultural deaths in Canada.



Other machine types: airplane (9), rock picker (6), hay elevator (6), power tool (4), snow blower (4), spraying equipment (3), other named (6), unknown (8).

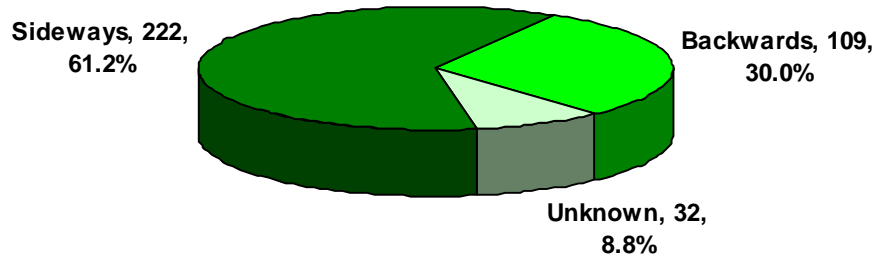
3.14 Fatal agricultural runovers by runover category, 1990-2005

There were 329 agricultural runover fatalities from 1990 to 2005. Alighted operator runovers (27.7%) were the most frequent type of fatal runover. In this kind of injury event, the victim is runover by a vehicle he/she had left running or unblocked on a slope. Bystander runovers caused the second largest percentage of runover fatalities (27.4%), followed by fallen operator runovers (18.5%), extra rider runovers (15.2%), and improper start runovers (9.7%).



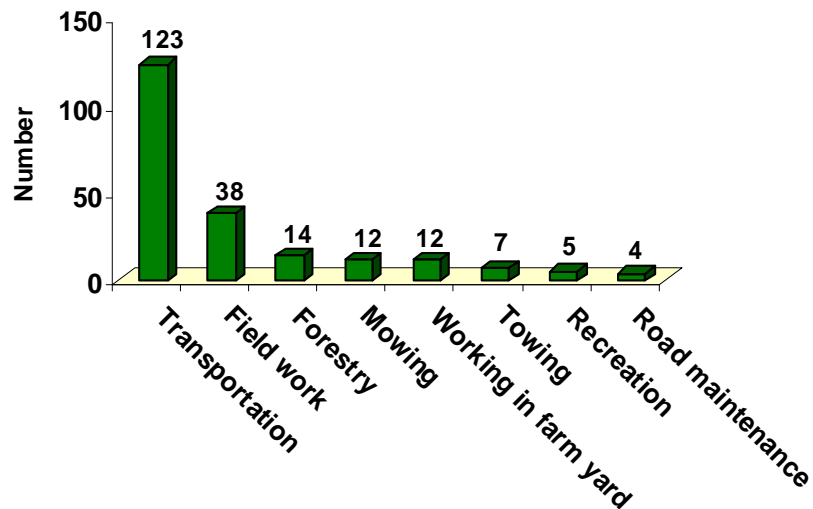
3.15 Fatal agricultural machine rollovers by rollover type, 1990-2005

Overall, 61.2% of the 363 fatal agricultural machine rollovers in Canada from 1990 to 2005 were sideways in direction. Another 30.0% of the rollovers were backwards. In 8.8% of the cases, the direction of rollover could not be determined. Sideways rollovers were more frequent in younger adults and children while backwards rollovers were more frequent in adults aged 60 and over.



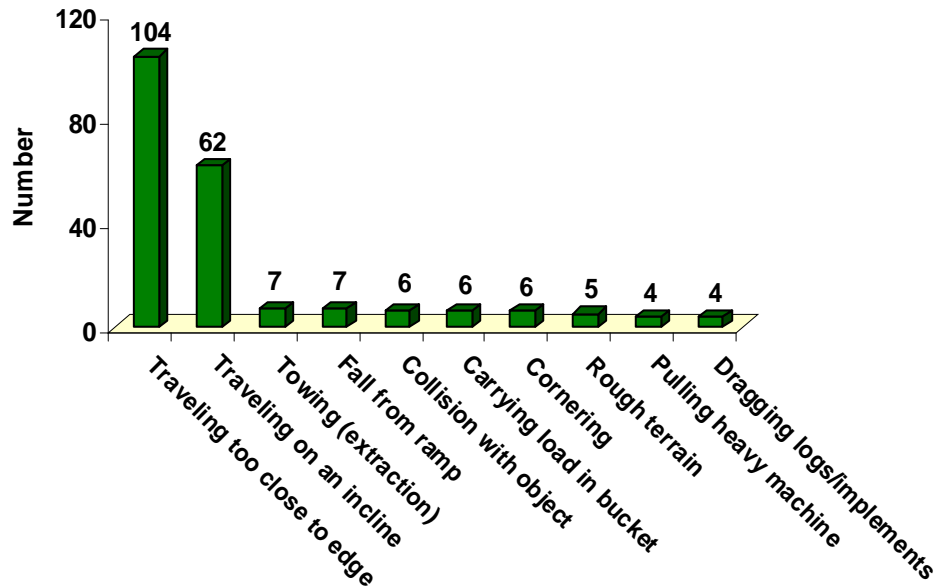
3.16 Fatal sideways agricultural rollovers by activity prior to rollover, 1990-2005

In fatal sideways machine rollovers, injury circumstance text descriptions showed that the decedents' most common activities prior to the rollover were driving on highways and farm roads (55.4%) and field work (17.1%).



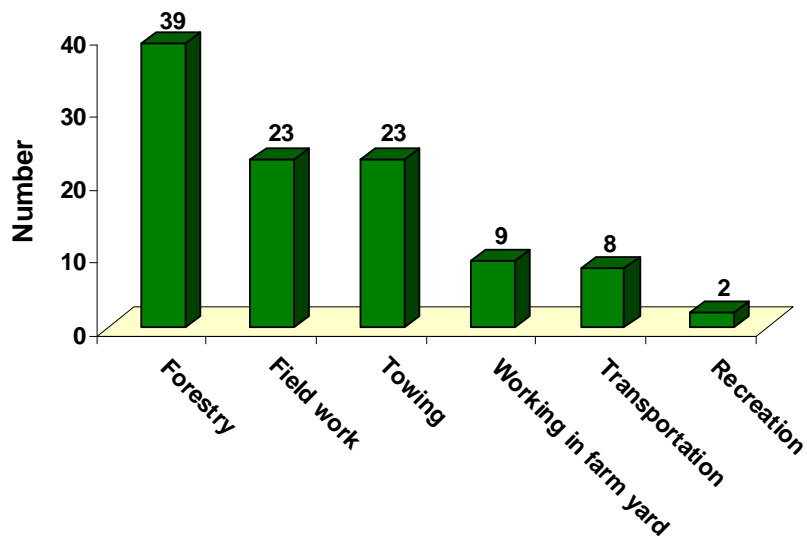
3.17 Fatal sideways agricultural rollovers by immediate cause of rollover, 1990-2005

In 46.8% of fatal sideways machine rollovers, circumstance text descriptions attributed the rollover to the machine or vehicle travelling too close to the edge of a ditch or other steep slope bordering a road or field. In 27.9% of the cases, the rollover was said to be due to the machine or vehicle travelling on a steep incline. In 28.4% of the rollovers overall, towing a machine or trailer may have been a contributing factor. Considering both circumstance text and location of occurrence, 72.5% of sideways rollovers involved steep slopes such as ditches, ravines, ramps and embankments.



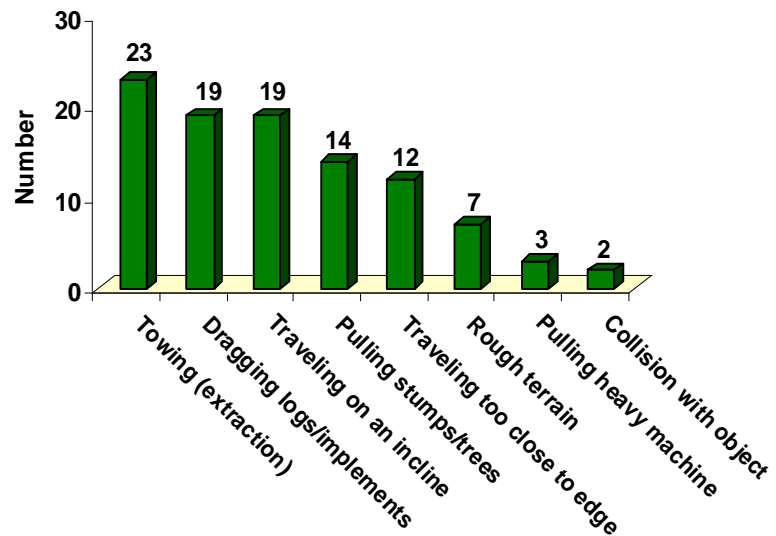
3.18 Fatal backwards agricultural rollovers by activity prior to rollover, 1990-2005

In fatal backwards machine rollovers, circumstance text descriptions showed that the decedents' most common activities prior to the rollover were harvesting wood and maintaining woodlots (35.8%), field work (21.1%) and towing (21.1%).



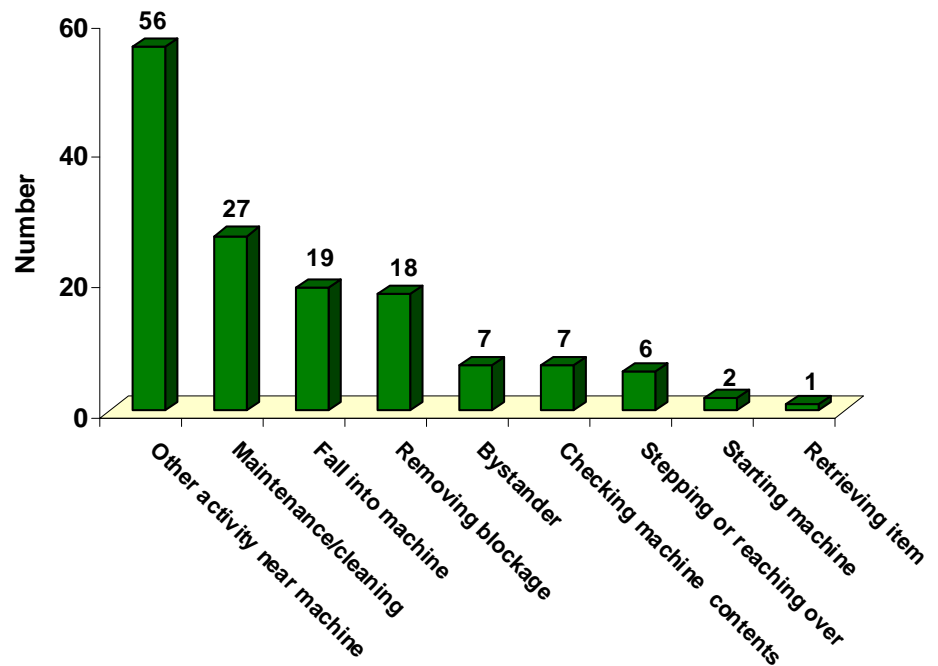
3.19 Fatal backwards agricultural rollovers by immediate cause of rollover, 1990-2005

According to circumstance text descriptions, 21.1% of fatal backwards rollovers were due to improper towing (extraction) practices. A further 17.4% were caused by dragging logs or implements along the ground, 17.4% were due to travelling on a steep incline, and 12.8% occurred because of stump pulling. In another 11.0% of the cases the machine or vehicle was said to be travelling too close to the edge of a ditch, ravine or other steep surface. In 61.5% of the cases overall, towing may have been a contributing factor. In 36.7% of the cases, a steep slope was either described in the circumstance text or was apparent from the location of occurrence.



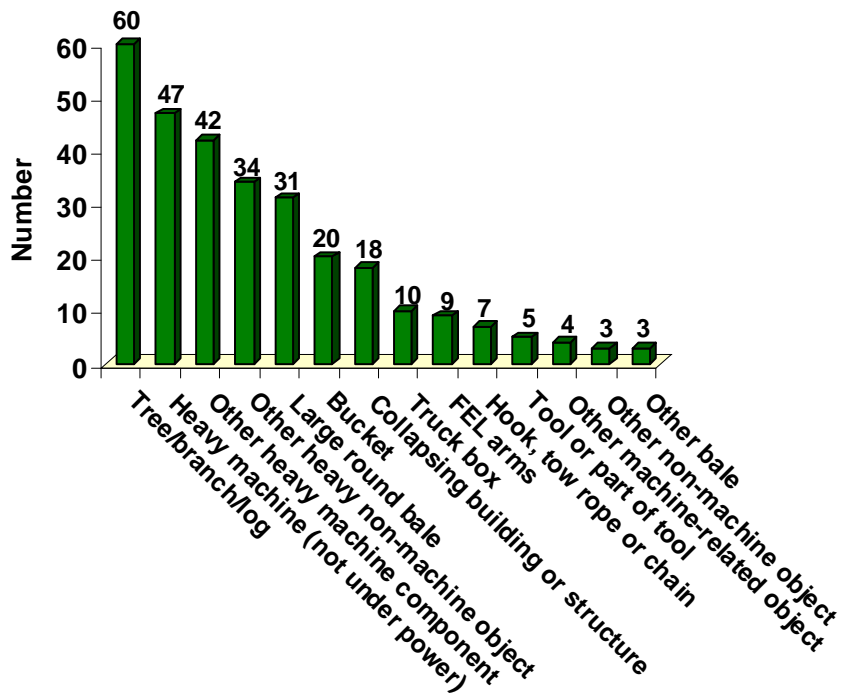
3.20 Fatal entanglements by activity prior to entanglement, 1990-2005

Circumstance text descriptions cite loose clothing or hair as the cause of 53.7% of the 147 fatal machine entanglements from 1990 to 2005. In 38.1% of the cases, victims were performing a variety of work tasks close to an entanglement hazard. In 18.4% of entanglements the victim had been cleaning or repairing a machine without shutting it off. In 12.9% of fatal entanglements, the decedent slipped and fell into a machine. In a further 12.2% of cases he/she was removing a blockage without first shutting the machine off. Only 4.8% of entanglement deaths were due to the actions of someone other than the deceased.



3.21 Fatal struck by object and pinned or struck by machine injuries, by type of object or component, 1990-2005

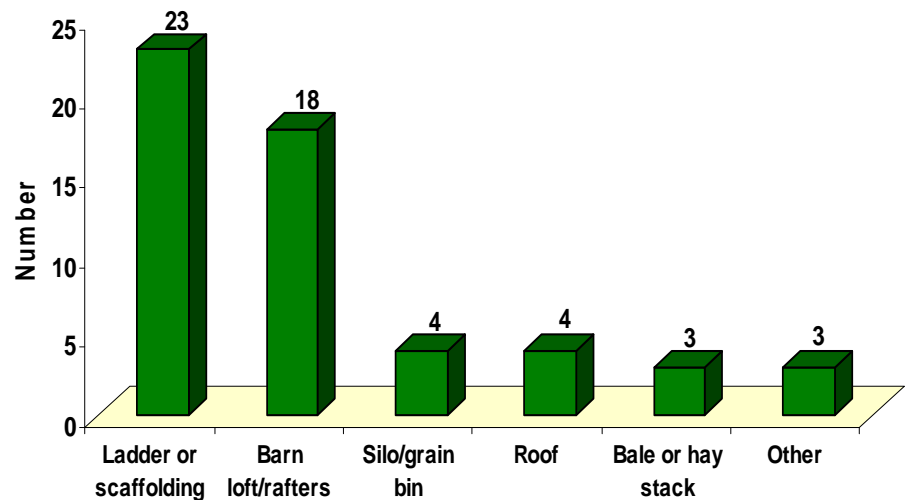
From 1990 to 2005, 143 people were struck and killed by an object on a farm. In 20.5% of all struck by object deaths, the victim was killed by a tree or tree branch during woodcutting activities. In another 16.0% of the fatalities, victims were crushed under a machine or vehicle because of jack, blocking or hydraulic failure. Other objects cited in fatality circumstance descriptions include heavy machine components such as transmissions, hay racks, tires and booms (14.3%), heavy non-machine objects such as gates and fence panels (11.6%), and large round bales (10.6%).



3.22 Fatal agricultural non-machine and machine falls from height, by fall location, 1990-2005

42.6% of the 55 fatal non-machine falls from height that occurred from 1990 to 2005 involved ladders or scaffolding. Barn lofts and rafters were the location of occurrence for another 33.3% of fatal falls.

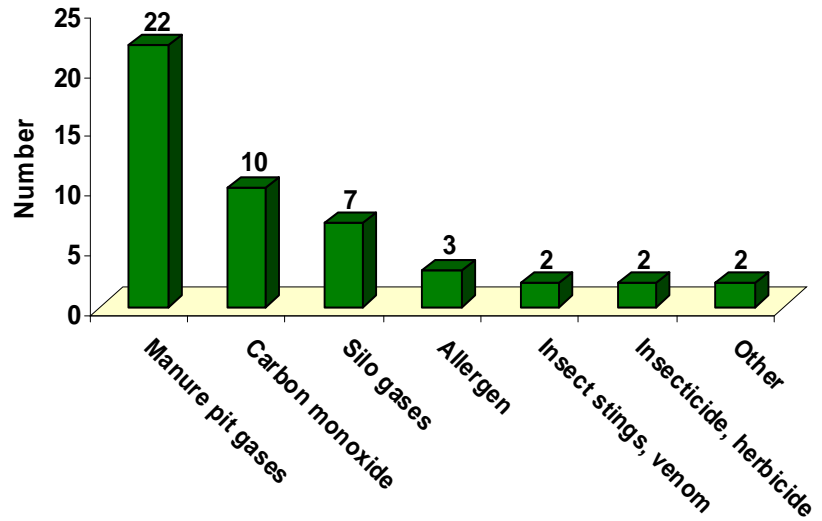
No falls from stationary machines resulted in death, but there were a total of 33 fatal falls from moving machines and 111 falls from moving machines where the victim was subsequently runover.



3.23 Fatal agricultural toxic substance injuries by type of substance, 1990-2005

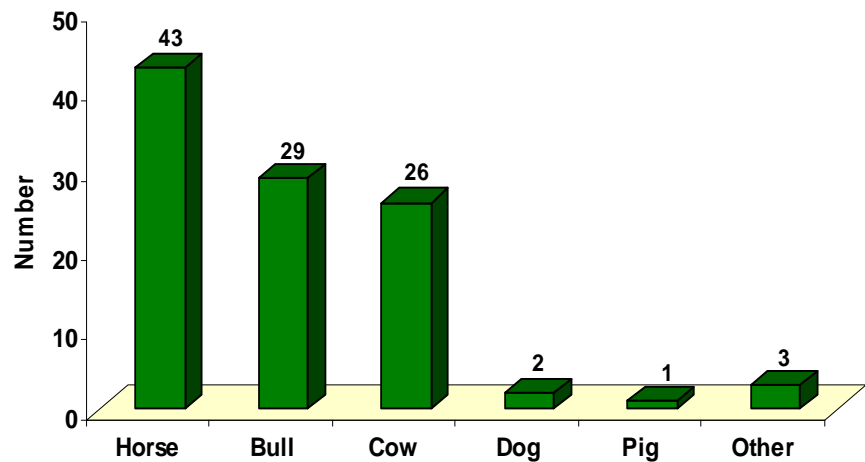
45.8% of the 47 agricultural fatalities from 1990 to 2005 due to toxic substance exposure were attributed to hydrogen sulfide poisoning. Another 20.8% were caused by carbon monoxide inhalation, most frequently associated with running engines indoors in winter with insufficient ventilation. 14.6% of the deaths were due to inhalation of silo gases.

Hydrogen sulfide exposure occurs when workers enter a poorly ventilated area containing manure or sewage. Storage areas for hog manure are especially prone to hydrogen sulfide accumulation. 63.6% of the hydrogen sulfide deaths involved multiple fatalities when would-be rescuers entered dangerous confined spaces without the proper equipment. There were two triple and four double hydrogen sulfide fatalities from 1990 to 2005.



3.24 Fatal agricultural animal injuries by type of animal, 1990-2005

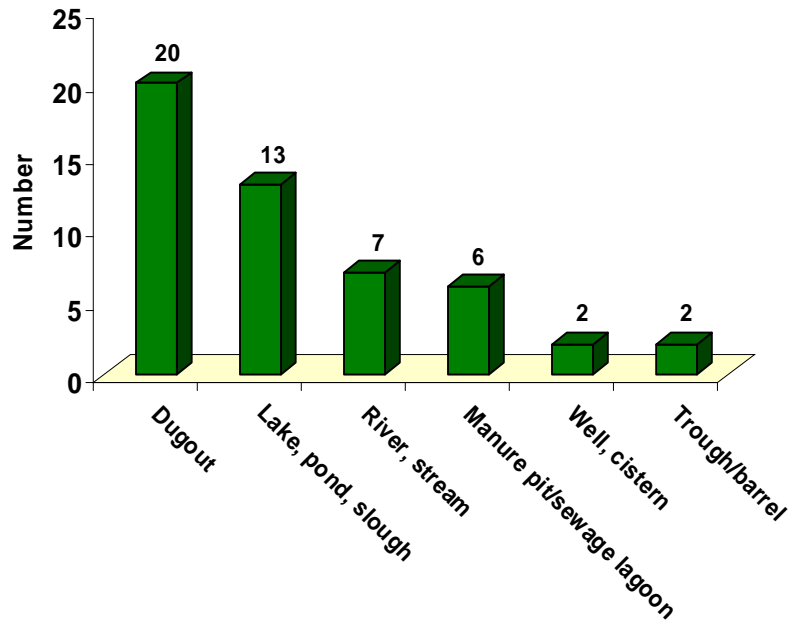
There were 104 animal-related deaths in Canada from 1990-2005 (5.9% of all agricultural deaths). Of these, 41.3% were caused by horses, 27.9% involved bulls and 25.0% were due to cows. 32.6% of the deaths associated with horses were not work related. They are included in the CAISP fatality database because horses are considered to be a hazard of the farm environment.



3.25 Fatal agricultural drownings by drowning location, 1990-2005

Of the 56 non-machine related drowning deaths from 1990 to 2005, 37.5% occurred in dugouts, 23.2% in lakes or ponds, 12.5% in rivers or streams and 10.7% in manure pits or sewage lagoons. 55.4% of the victims were less than ten years old.

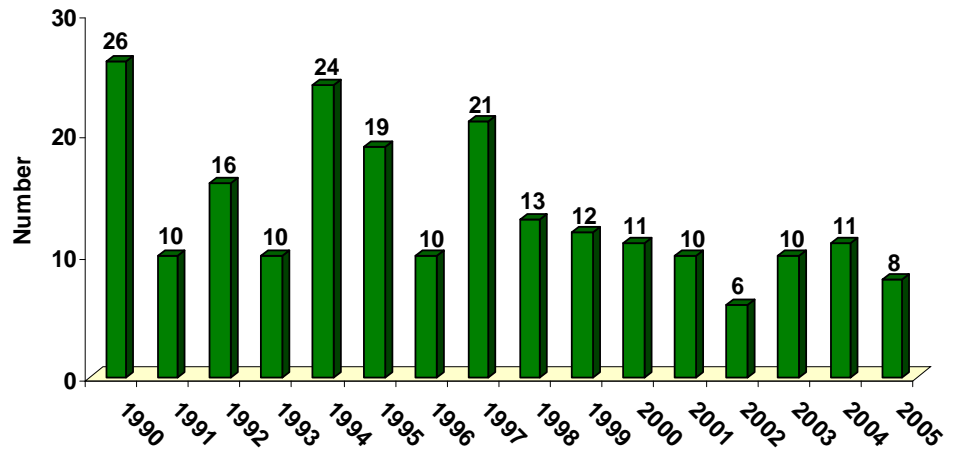
There were nine machine-related drownings due to collisions with water. Five of these drownings took place in dugouts. The other four drownings occurred in a creek, a slough, a pond and a water-filled ditch.



4 AGRICULTURAL FATALITIES IN CANADA: CHILDREN AND YOUTH UNDER AGE 15

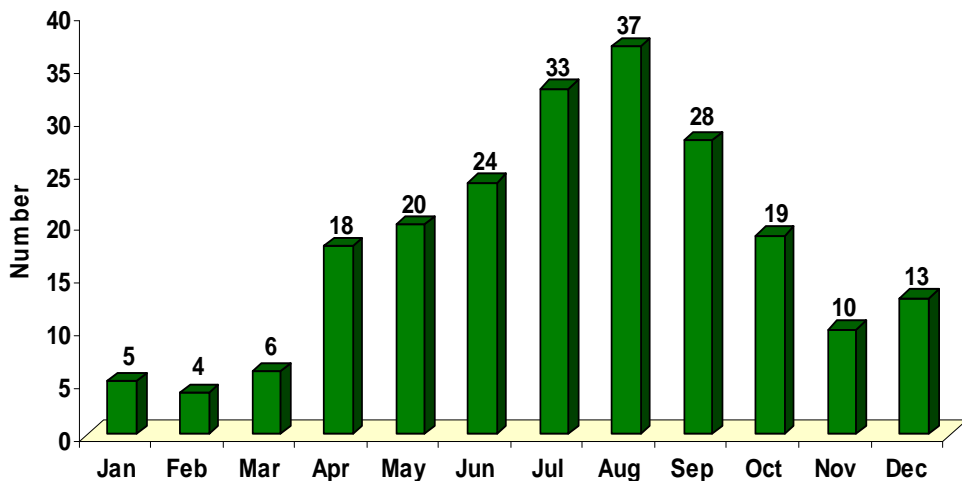
4.1 Fatal agricultural injuries in children and youth by calendar year, 1990-2005

From 1990 to 2005, there were 217 agricultural fatalities among children and youth aged 14 and under. (An average of 13.6 per year.) The peak year for fatalities was 1990, with 26 cases (12.0% of the total number of cases). The average number of child fatalities per year was 17.0 for the first eight years of the surveillance period, but only 10.1 for the last eight years. This decline in the average annual number of fatalities may be due, in part, to better child safety practices



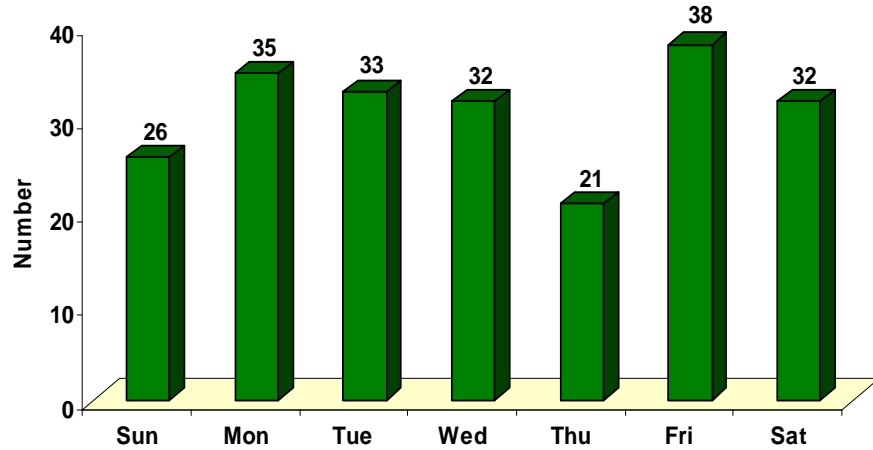
4.2 Fatal agricultural injuries in children and youth by month, 1990-2005

From 1990 to 2005, 32.3% of all child agricultural fatalities occurred during the school holiday months of July and August, with August having the highest proportion of fatalities (17.1%). 56.2% of the deaths occurred in the four months from June to September. Very few children were killed in the winter months of January, February and March.



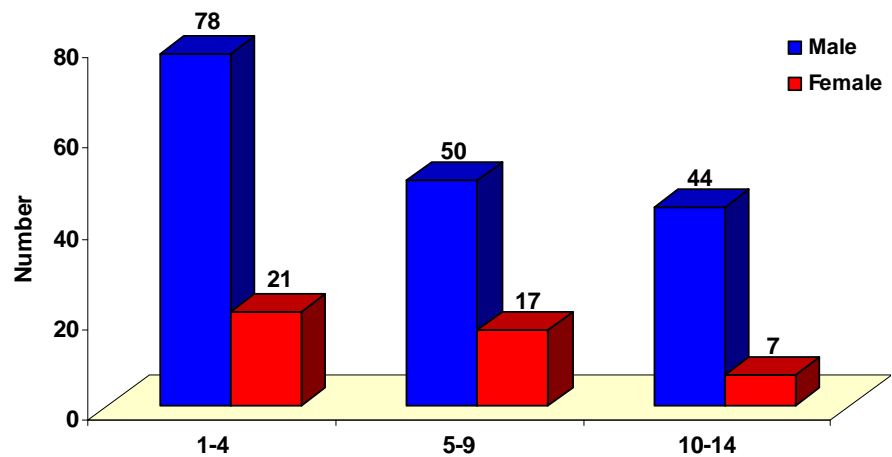
4.3 Fatal agricultural injuries in children and youth by weekday, 1990-2005

In children, there was no clear pattern of injury occurrence by day of the week. The smallest number of child deaths occurred on Thursdays (9.7%). As was the case for adults, a relatively low number of fatalities took place on Sundays.



4.4a Fatal agricultural injuries in children and youth by age group and gender, 1990-2005

From 1990 to 2005, 79.3% of the child victims of agricultural fatalities were male. The ratio of males to females was highest for the 10- to 14-year-old age group (6.3:1), and lowest for the 1- to 4-year-old age group (3.7:1). There was a higher proportion of females killed in the one- to four-year-old age group than in any other age group, including adults.



4.4b Fatal agricultural injuries in children and youth by age group and gender, 1990-2005

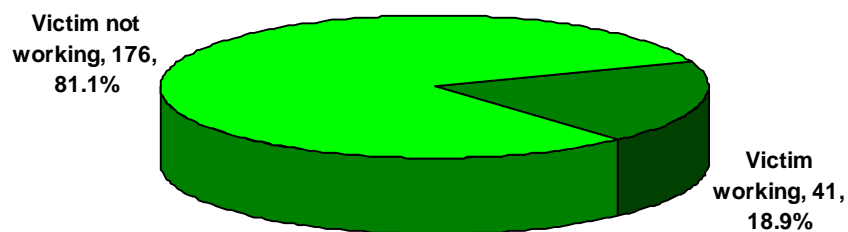
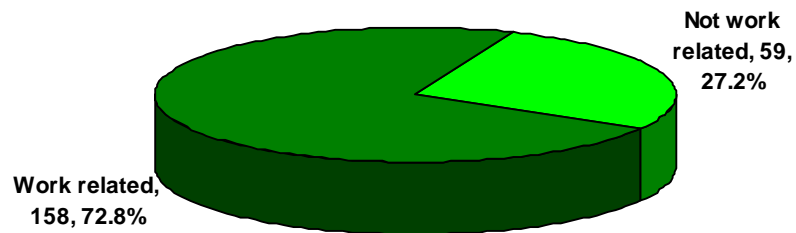
45.6% (99) of the children killed in agricultural injury events from 1990 to 2005 were less than five years old, including 17 one-year-old toddlers and 62 two- and three-year-old toddlers. 78.5% of them were male. 55.7% were killed in machine runovers and 17.7% drowned.

Age group	1-4	5-9	10-14	Total	Percent
Male	78	50	44	172	79.3
Female	21	17	7	45	20.7
Total	99	67	51		
Percent	45.6	30.9	23.5		

4.5 Fatal agricultural injuries in children and youth: the relationship to agricultural work, 1990-2005

Although 72.8% of the agricultural fatalities among children were work related, in most cases (81.1%) the victim was not performing the work. He or she was killed by someone else who was engaged in agricultural work.

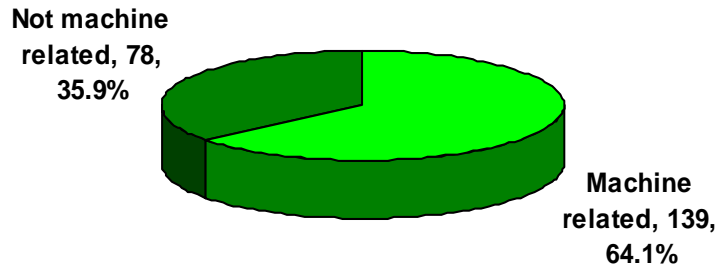
Non-work related agricultural deaths included those due to hazards of the farm environment such as large animals, improperly stored equipment, barn lofts, dugouts, sewage lagoons and troughs.



4.6 Fatal agricultural injuries in children and youth by major cause, 1990-2005

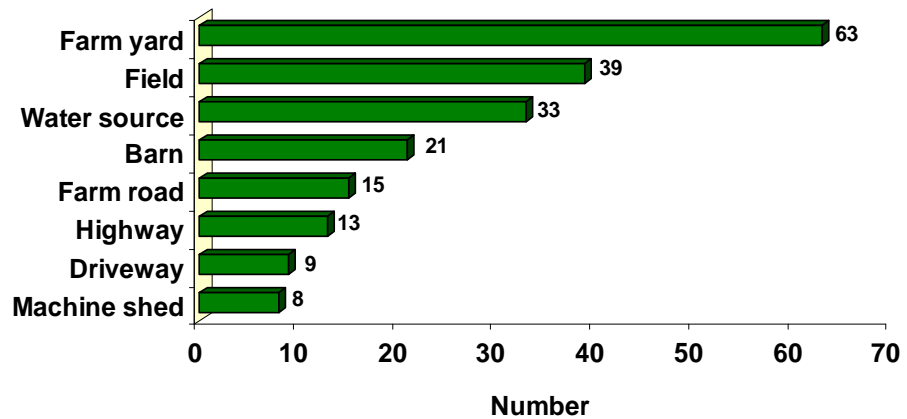
64.1% of agricultural fatalities in children were machine related. These included machine runovers, machine rollovers and machine entanglements. (Figure 4.8).

The 35.9% of agricultural fatalities that were not machine related included drownings, being struck by objects, being caught under heavy objects and falling from a height. (Figure 4.8).



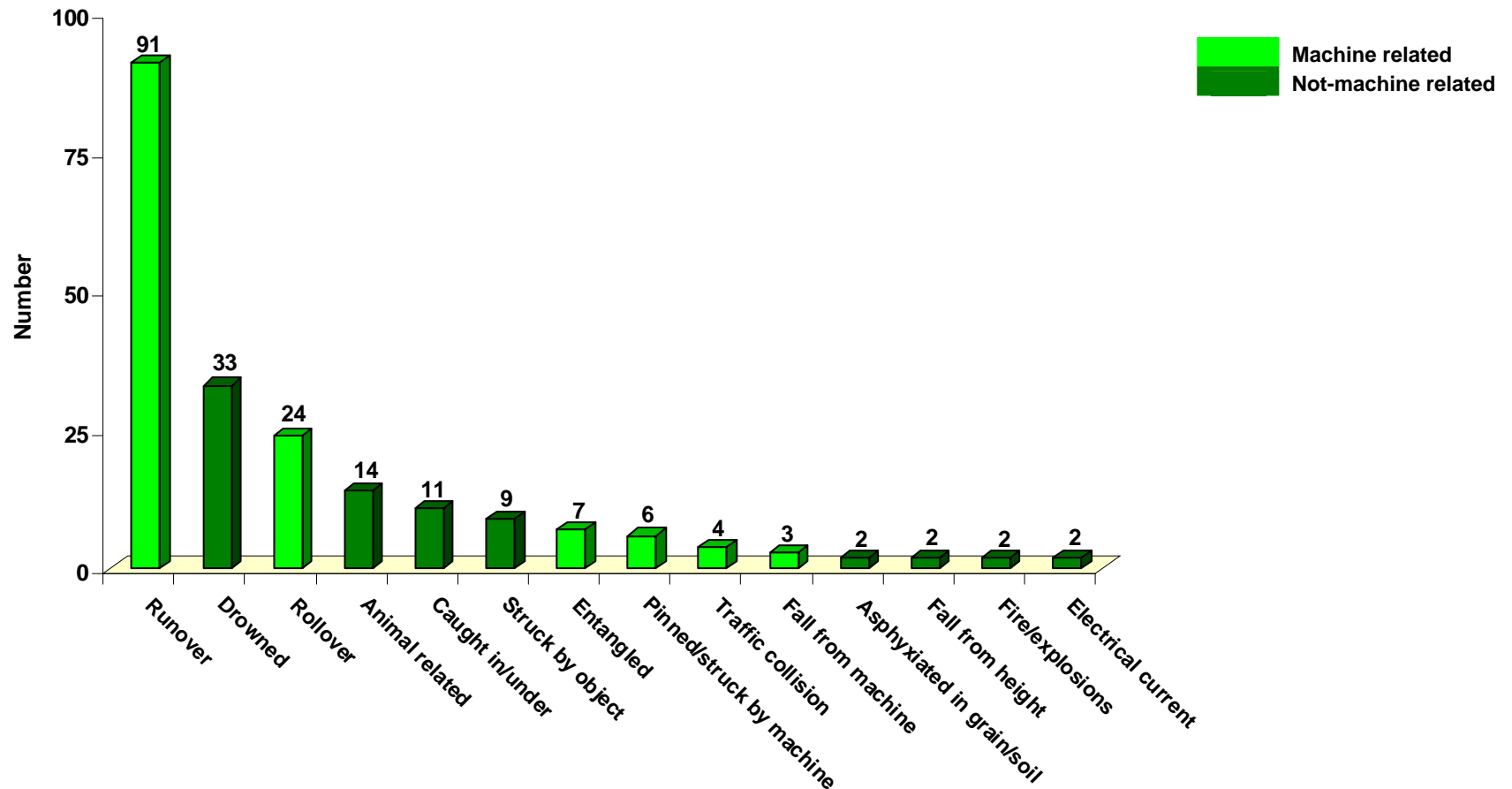
4.7 Fatal agricultural injuries in children and youth by location of injury, 1990-2005

The most common locations for child agricultural fatalities were farm yards (29.0%), fields (18.0%), water sources (15.2%) and barns (9.7%). At least 47.0% of the deaths occurred in locations close to the farm home such as the farm yard, farm driveway, barn and sheds. Leaving small children to play unsupervised near the farm home is a dangerous practice.



Location was not known in 7 cases.

4.8 Fatal agricultural injuries in children and youth by cause of injury, 1990-2005



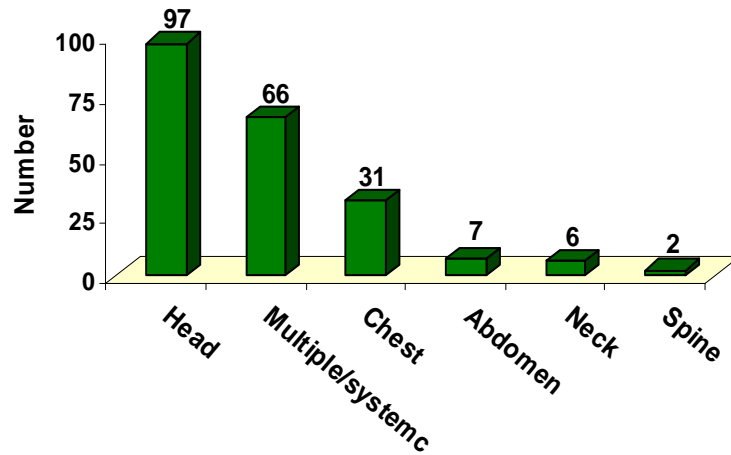
For children aged fourteen and under, machine runovers caused by far the largest proportion of fatal injuries (41.9%), followed by drownings (15.2%), machine rollovers (11.1%), animal-related incidents (6.5%), being caught in or under an object (5.1%) and being struck by a non-machine object (4.1%). In children, just three mechanisms of injury (machine runovers, drownings and machine rollovers) were responsible for 68.2% all deaths. Runovers and drownings were most common among young children. Older children and teenagers were more often killed in machine runovers and rollovers.

Another 4 machine-related and 1 non machine related cases with less than two fatalities per cause of injury were not included in the above figure.

4.9 Fatal agricultural injuries in children and youth by body part injured, 1990-2005

Where the primary nature of injury was known, the head was cited as the body part involved in 44.7% of the injuries that most probably caused death in children. 30.4% of the deaths involved injuries to multiple body parts (such as severe crush injuries), or systemic injuries like drownings. In 14.3% of the fatalities, the head was the most severely injured body part.

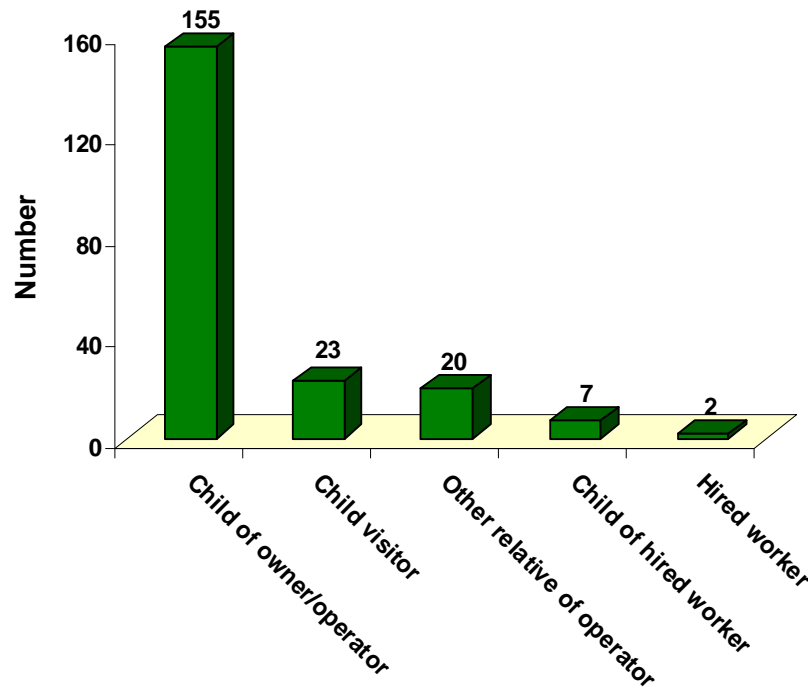
62.2% of the children were so badly injured that they either died at the scene or on the way to hospital.



The body part involved in the most important injury ('nature of injury 1') was not known in 8 cases.

4.10 Fatal agricultural injuries in children and youth by relationship to farm operator, 1990-2005

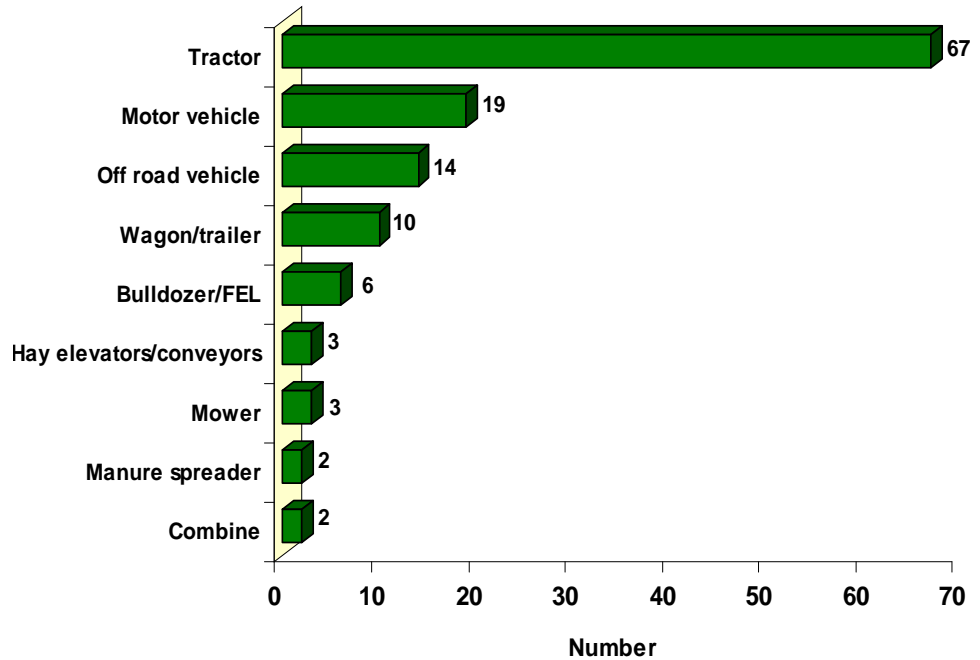
From 1990 to 2005, 71.4% of persons aged one to fourteen killed in agricultural injury events were children of owner/operators. A further 10.6% were child visitors and 9.2% were other relatives of farm operators.



4.11 Fatal agricultural injuries in children and youth by machine type, 1990-2005

The machine types most frequently involved in agricultural fatalities among children were tractors (48.2%), motor vehicles (13.7%), off road vehicles (10.1%) and wagons/trailers (7.2%).

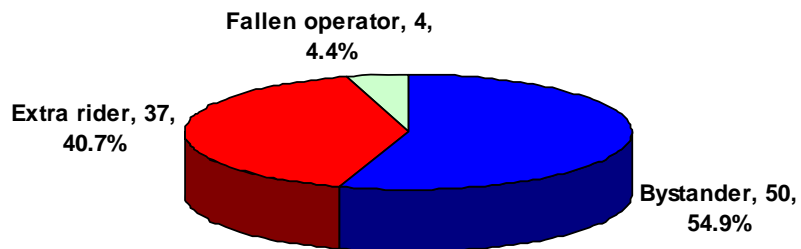
Tractors were associated with 30.9% of child deaths overall. The practice of taking a child as an extra rider on a tractor frequently results in serious injury or death.



Other machine types: plough (1), auger (1), baler (1), power tool (1), harvester (1), other named (6), unknown (1).

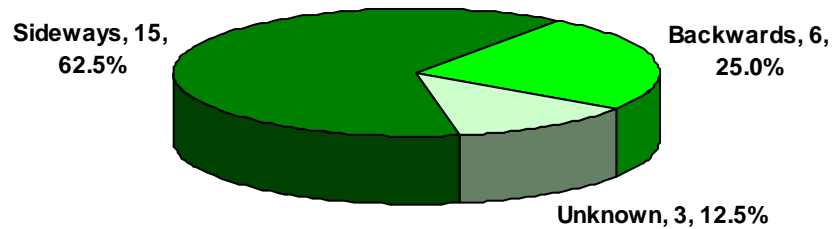
4.12 Fatal agricultural runovers in children and youth by runover category, 1990-2005

Of the 91 fatal child runovers from 1990 to 2005, bystander runovers were the most frequent runover type (54.9%). A further 40.7% of the child runover victims were killed when they fell from a machine that they had been riding as a passenger and were subsequently runover. 4.4% of the children were runover by machines that they had been operating themselves.



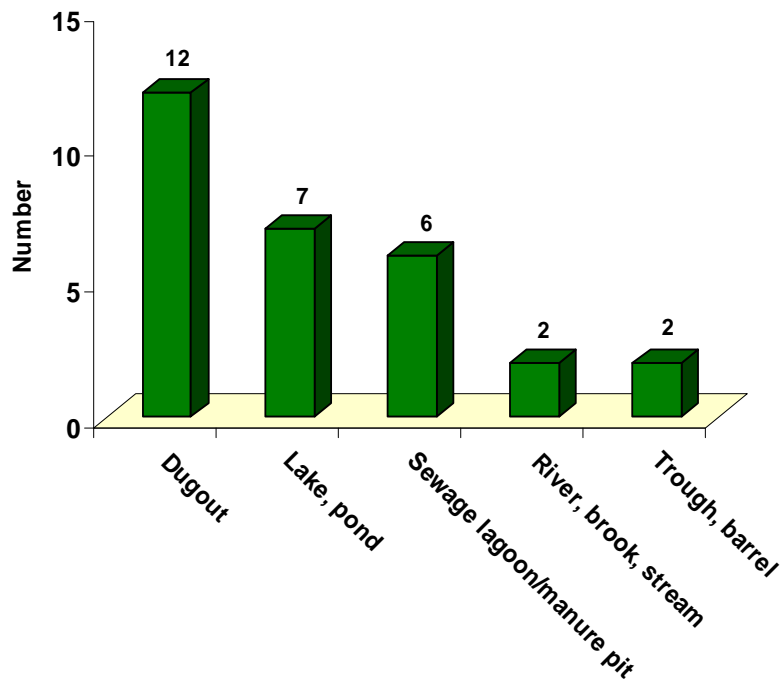
4.13 Fatal agricultural rollovers in children and youth by rollover type, 1990-2005

Overall, 62.5% of the 24 fatal machine rollovers in children from 1990 to 2005 were sideways in direction. Another 25.0% of the rollovers were backwards. In 12.5% of the cases, the direction of rollover could not be determined.



4.14 Fatal agricultural drownings in children and youth by drowning location, 1990-2005

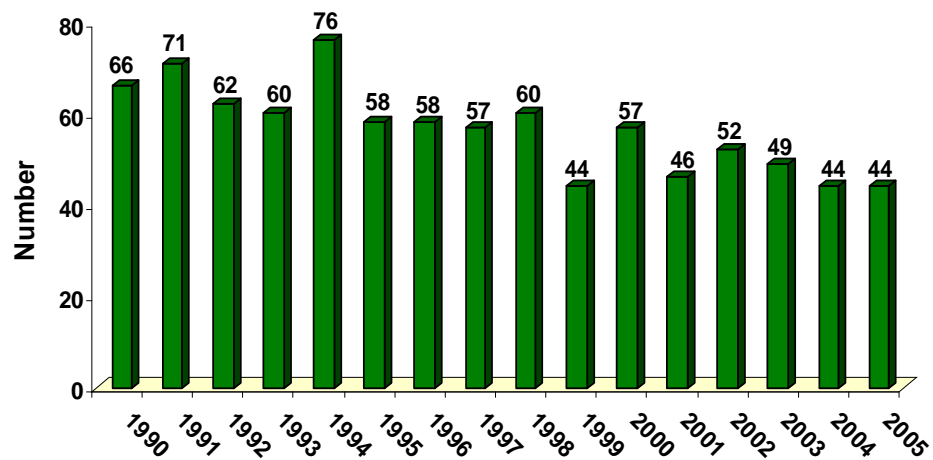
Of the 34 drowning deaths in children and youth from 1990 to 2005, 35.3% occurred in dugouts, 20.6% in lakes or ponds and 17.6% in manure pits or sewage lagoons. 73.5% of the victims were less than six years old. Only one drowning was machine-related.



5 AGRICULTURAL FATALITIES IN CANADA: ADULTS AGED 15 TO 59

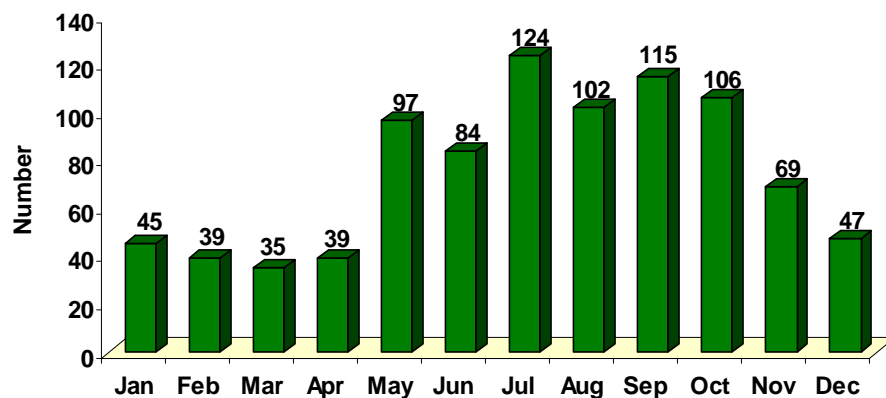
5.1 Fatal agricultural injuries in adults aged 15 to 59 by calendar year, 1990-2005

From 1990 to 2005, there were 904 agricultural fatalities among Canadian adults aged 15 to 59. (An average of about 56.5 per year.) The peak year for fatalities was 1994, with 76 cases (8.4% of the total number of cases). The average number of fatalities per year was 63.5 for the first eight years of the surveillance period, and 49.5 for the last eight years. The decline in the average annual number of fatalities was mainly due to a reduction in machine rollover fatalities over the surveillance period.



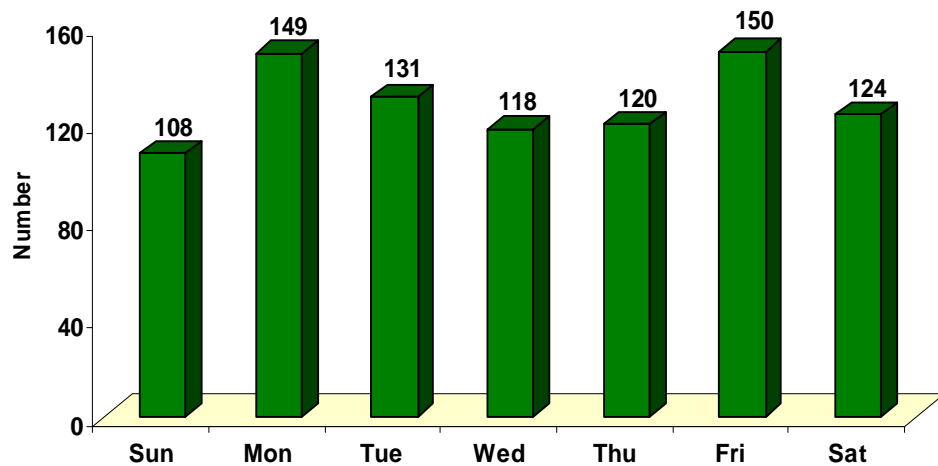
5.2 Fatal agricultural injuries in adults aged 15 to 59 by month, 1990-2005

69.5% of all agricultural fatalities in younger adults aged 15 to 59 occurred from May to October. July was the peak month, with 13.7% of all fatalities. Relatively few younger adults were killed from December to April.



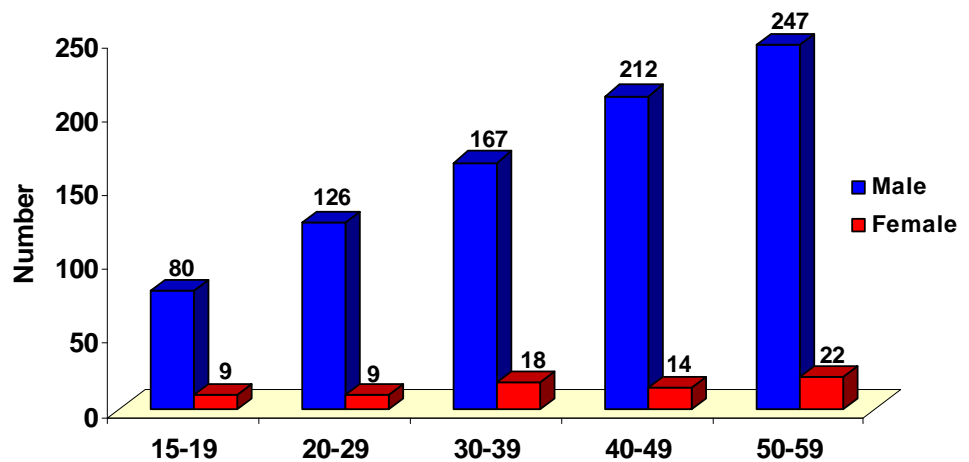
5.3 Fatal agricultural injuries in adults aged 15 to 59 by weekday, 1990-2005

Fewer fatalities occurred on Sundays (11.9%) than on any other day of the week. Mondays and Fridays were the days with the highest proportions of fatal injury events (16.5% and 16.6% respectively.)



5.4a Fatal agricultural injuries in adults aged 15 to 59 by age group and gender, 1990-2005

92.0% of the younger adults killed in agricultural injury events were male. The proportion of younger adult victims who were male was 12.7% higher than the proportion of children under fifteen who were male because of the large number of young female children who were killed. In younger adults, the ratio of males to females was highest for the 50- to 59-year-old age group (15.1:1), and lowest for the 15- to 19-year-old age group (8.8:1). In males, there was a clear trend for an increase in fatalities with increasing age.



5.4b Fatal agricultural injuries in adults aged 15 to 59 by age group and gender, 1990-2005

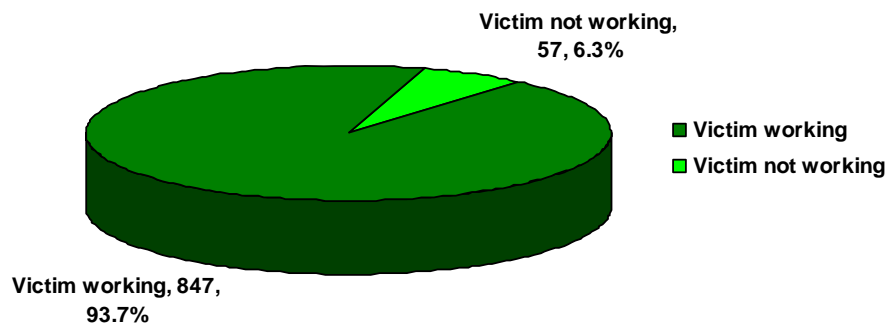
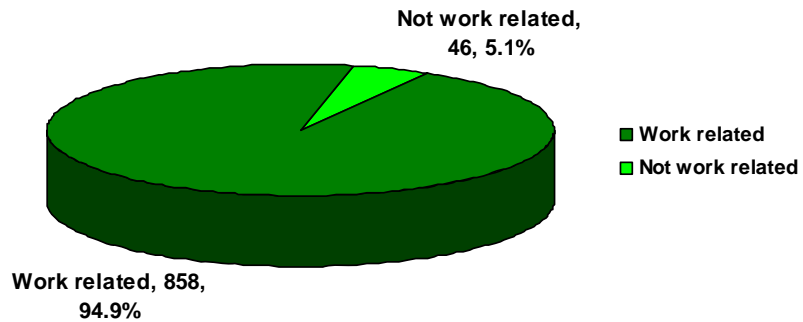
Older members of the 15- to 59-year-old age group were more likely to be killed in an agricultural injury event than younger members were. The proportion of adults in the 15- to 59-year-old age group who were fatally injured increased steadily from the 20 to 29 age category to the 50 to 59 age category.

Fatalities by age group and gender							
Age group	15-19	20-29	30-39	40-49	50-59	Total	Percent
Male	80	126	167	212	247	832	92.0
Female	9	9	18	14	22	72	8.0
Total	89	135	185	226	269		
Percent	9.8	14.9	20.5	25	29.8		

5.5 Fatal agricultural injuries in adults aged 15 to 59: the relationship to agricultural work, 1990-2005

94.9% of the deaths in younger adults were work related. The few deaths that were not work related (5.1%) were due to hazards of the farm environment.

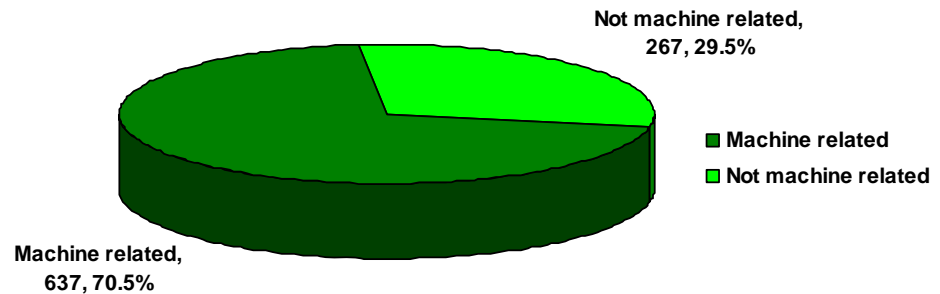
Most of the younger adults who died were engaged in agricultural work (93.7%). In contrast, the majority of children who were killed in work-related injury events were not working themselves.



5.6 Fatal agricultural injuries in adults aged 15 to 59 by major cause, 1990-2005

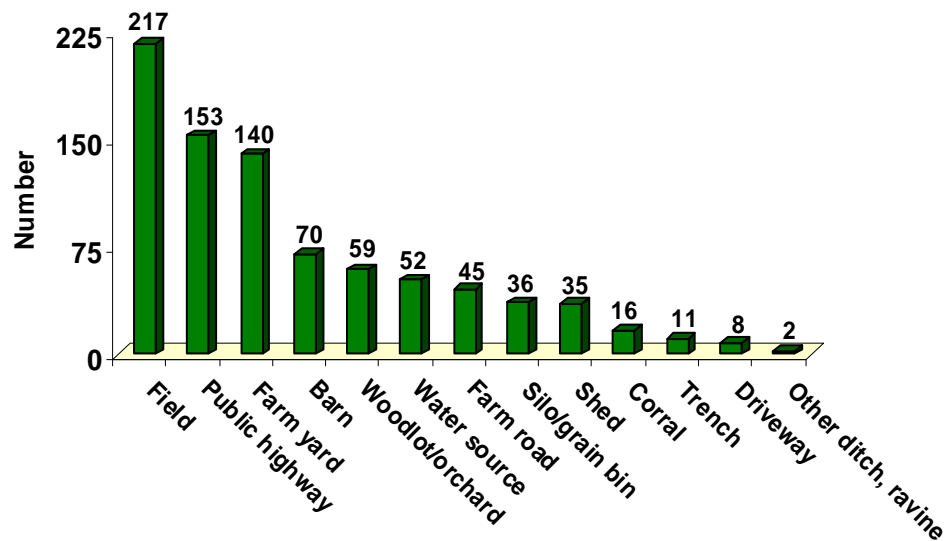
70.5% of agricultural fatalities in younger adults were machine related. The leading machine-related mechanisms of injury for this age group were machine rollovers, entanglements, traffic collisions and machine runovers. (Figure 5.8).

The agricultural fatalities that were not machine related (29.5%) included struck by object events, exposure to toxic substances, animal-related events and falls from height. (Figure 5.8).



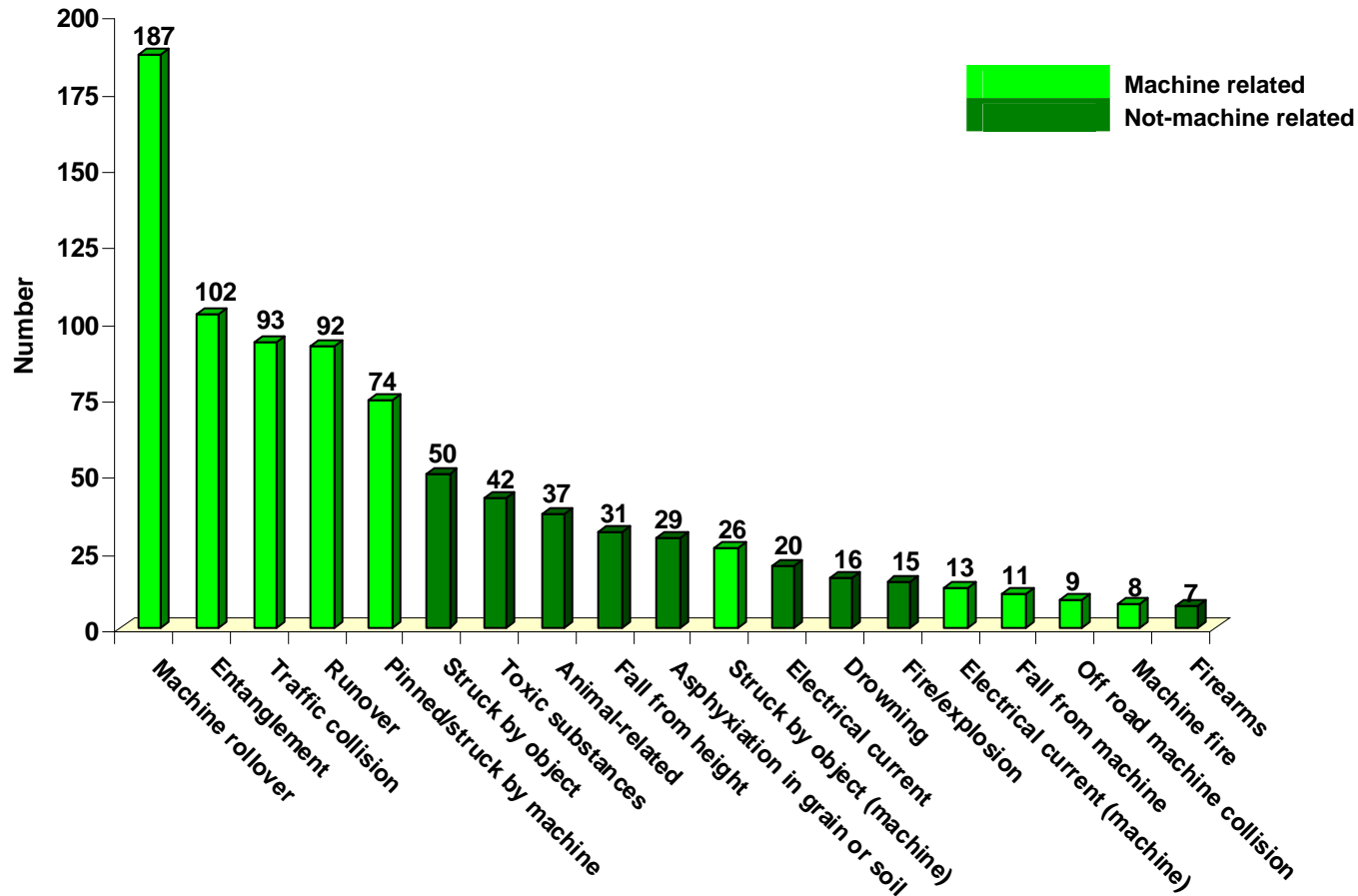
5.7 Fatal agricultural injuries in adults aged 15 to 59 by location of injury, 1990-2005

The most common locations of occurrence for agricultural fatalities in younger adults were fields and their adjacent ditches (24.0%), public roads and their adjacent ditches (16.9%), farm yards (15.5%), barns (7.7%) and woodlots (6.5%).



Location was not known in 40 cases.

5.8 Fatal agricultural injuries in adults aged 15 to 59 by cause of injury, 1990-2005



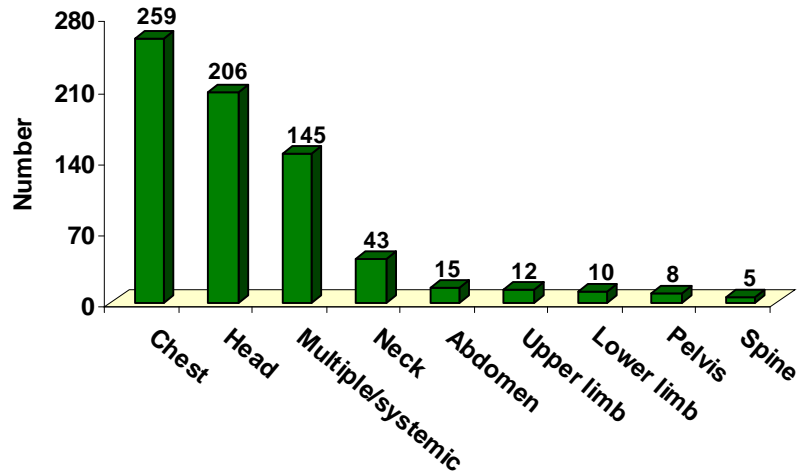
In adults aged 15 to 59, the leading causes of fatal injuries were machine rollovers (20.7%), machine entanglements (11.3%), traffic collisions (10.3%), machine runovers (10.2%), being pinned or struck by a machine (8.2%), being struck by a non-machine object (5.5%), and being exposed to toxic substances (4.6%). In contrast to children, where machine runovers were the leading cause of death, and to older adults where runovers caused almost as many deaths as machine rollovers, in younger adults machine rollovers were responsible more than twice as many fatalities as machine runovers.

Another 22 machine-related and 20 non machine related cases with less than six fatalities per cause of injury were not included in the above figure.

5.9 Fatal agricultural injuries in adults aged 15 to 59 by body part injured, 1990-2005

In younger adults, where the primary nature of injury was known, the chest was identified as the body part involved in 28.7% of the injuries that most probably caused death. Another 22.8% of the most serious injuries involved the head and 16.0% involved multiple body parts or systemic injuries like poisonings.

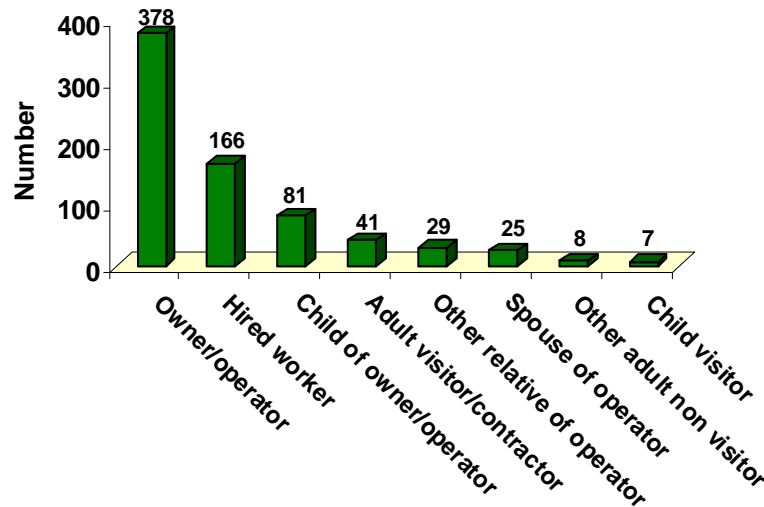
70.0% of the victims were so badly injured that they either died at the scene or on the way to hospital.



The body part involved in the most important injury ('nature of injury 1') was not known in 201 cases.

5.10 Fatal agricultural injuries in adults aged 15 to 59 by relationship to farm operator, 1990-2005

41.8% of younger adults killed in agricultural injury events were farm operators. A further 18.4% of the victims were hired workers and 9.0% were children or other relatives of operators. Only 5.3% of those killed were visitors or contractors.

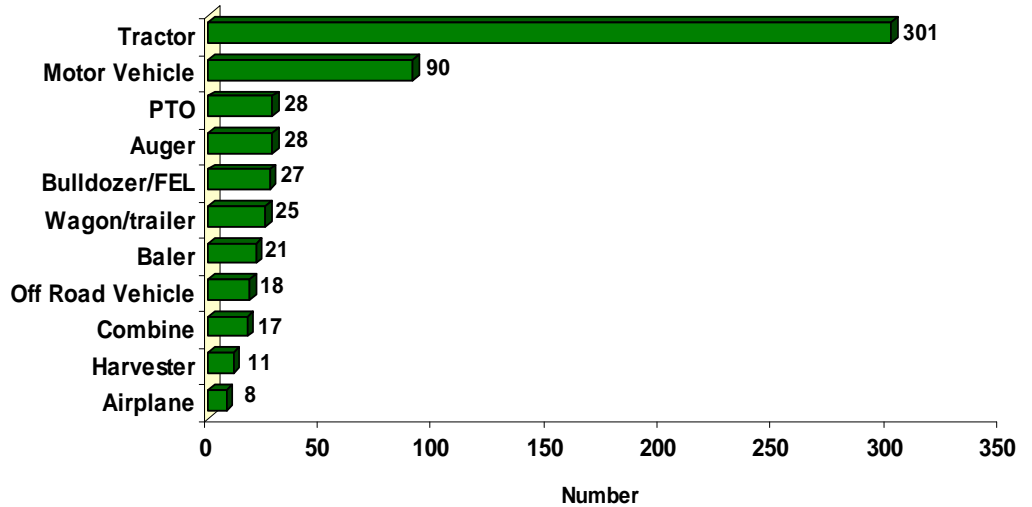


Relationship was not known in 103 cases.

5.11 Fatal agricultural injuries in adults aged 15 to 59 by machine type, 1990-2005

The machine types most frequently involved in agricultural fatalities among younger adults were tractors (47.3%) followed by motor vehicles (14.1%), wagons and trailers, augers and power take offs (both 4.4%), and bulldozer/FELs (4.2%).

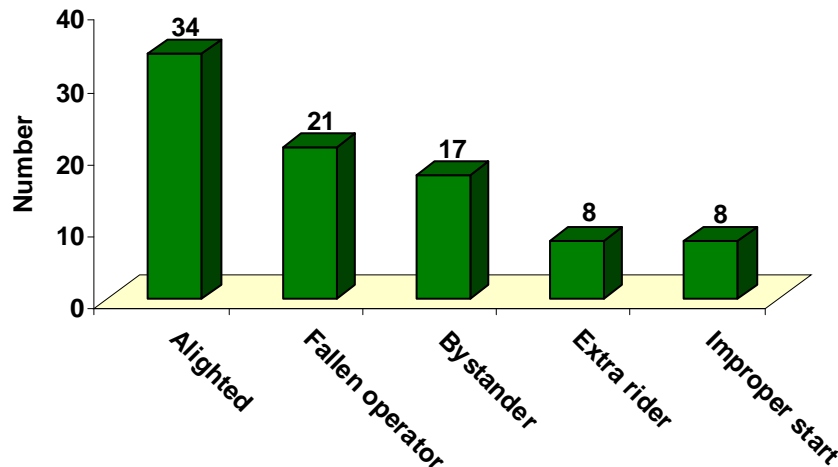
Tractors were associated with 33.4% of all agricultural deaths among younger adults.



Other machine types: plough (5), manure spreader (3), mower (3), hay elevator (3), power tool (3), snow blower (3), rock picker (2), chain saw (1), fencing equipment (1), planting equipment (1), other (29), and unknown (3).

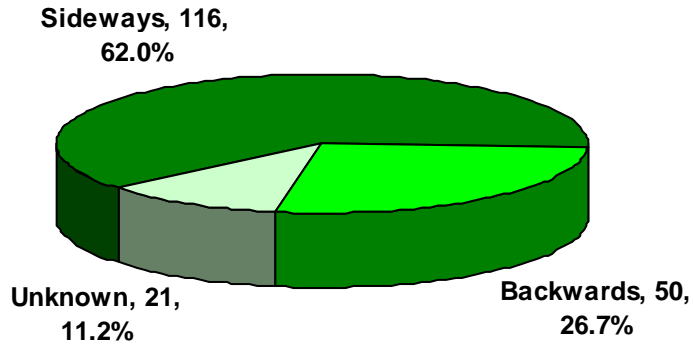
5.12 Fatal agricultural runovers in adults aged 15 to 59 by runover category, 1990-2005

There were 92 agricultural runover fatalities in younger adults from 1990 to 2005. Alighted operator runovers were by far the most frequent type of fatal runover (37.0%). In this kind of injury event, the victim is runover by a machine or vehicle he/she had left running or unblocked on a slope. Fallen operator runovers caused the second largest percentage of runover fatalities among younger adults (22.8%), followed by bystander runovers (18.5%), extra rider runovers and improper start runovers (both 8.7%).



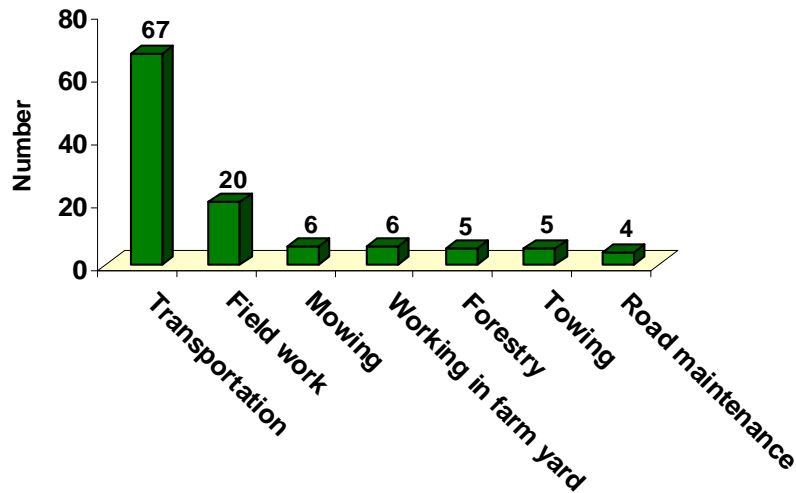
5.13 Fatal agricultural rollovers in adults aged 15 to 59 by rollover type, 1990-2005

In youth and adults aged 15 to 59, 62.0% of the fatal machine rollovers were sideways in direction and 26.7% were backwards. In 11.2% of the cases, the direction of rollover could not be determined. Sideways rollovers were more frequent in younger adults than in adults aged 60 or over.



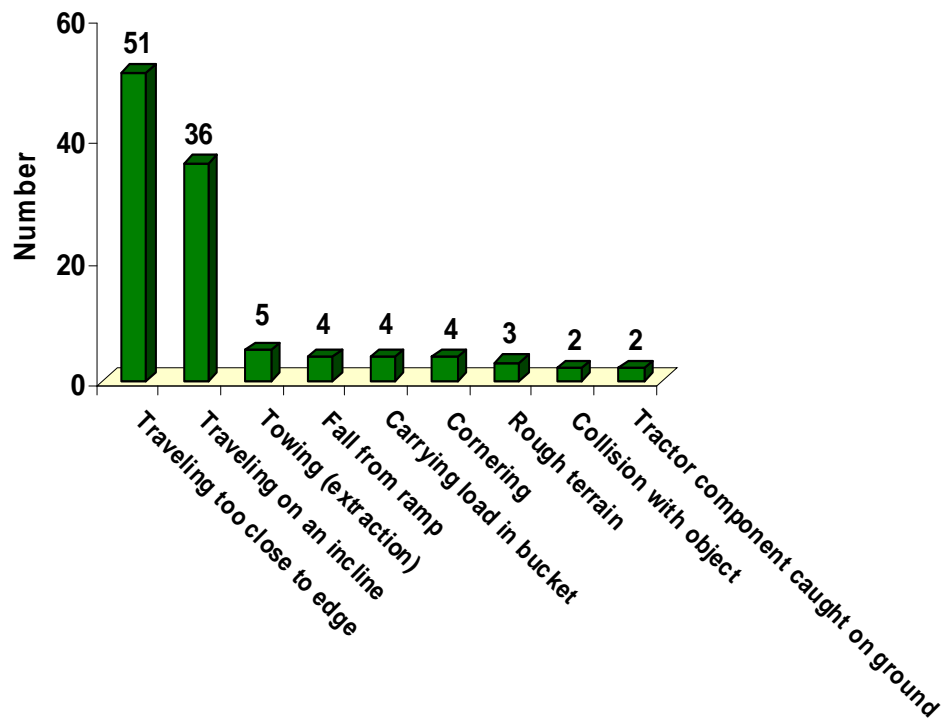
5.14 Fatal sideways agricultural rollovers in adults aged 15 to 59 by activity prior to rollover, 1990-2005

In fatal sideways machine rollovers among younger adults, injury circumstance text descriptions showed that the decedents' most common activities prior to the rollover were driving on highways and farm roads (57.8%) and doing field work (17.2%).



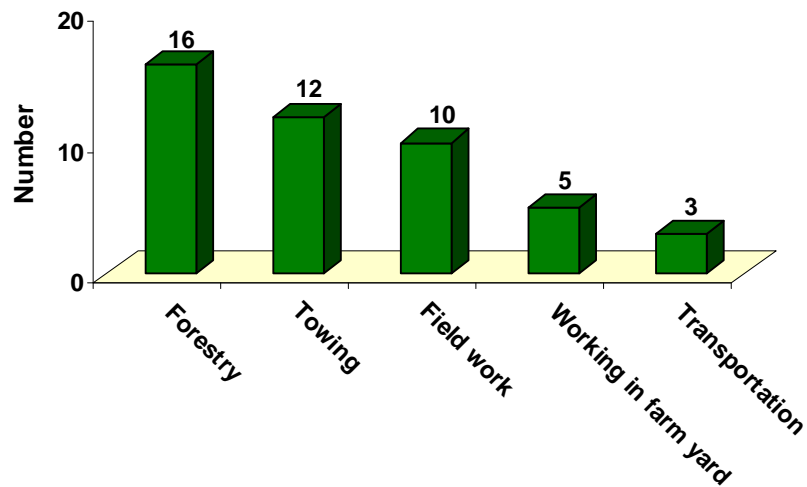
5.15 Fatal sideways agricultural rollovers in adults aged 15 to 59 by immediate cause of rollover, 1990-2005

According to circumstance text descriptions, in 44.0% of the fatal sideways machine rollovers, the rollover occurred because the machine or vehicle was travelling too close to the edge of a ditch or other steep slope bordering a road or field. In 31.0% of the cases, the rollover was most probably due to the machine or vehicle travelling on a steep incline. In 34.5% of the rollovers overall, towing a machine or trailer may have been a contributing factor. Considering both circumstance text and location of occurrence, 52.2% of sideways rollovers involved steep slopes such as ditches, ravines, ramps and embankments.



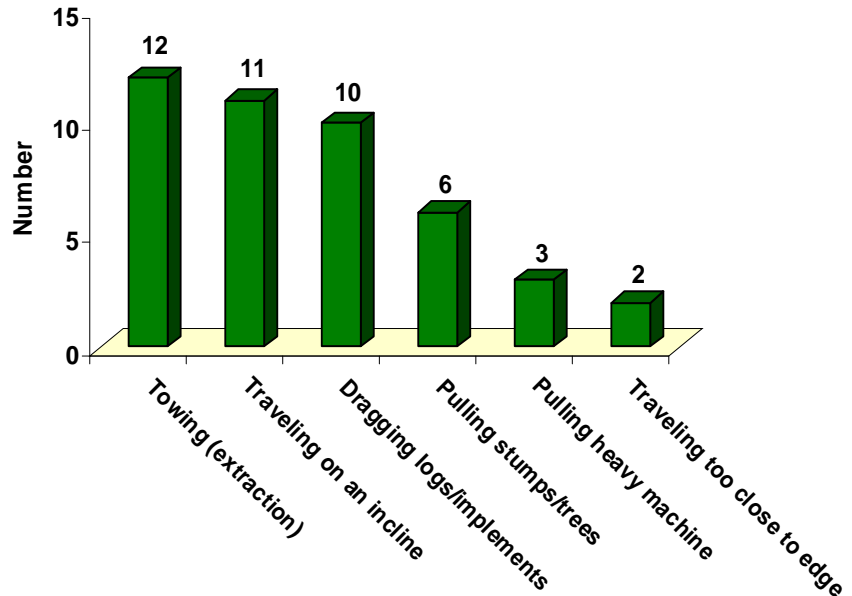
5.16 Fatal backwards agricultural rollovers in adults aged 15 to 59 by activity prior to rollover, 1990-2005

In fatal backwards machine rollovers among younger adults, circumstance text descriptions indicated that the victims' most common activities prior to the rollover were harvesting wood and maintaining woodlots (32.0%), towing (24.0%) and doing field work (20.0%).



5.17 Fatal backwards agricultural rollovers in adults aged 15 to 59 by immediate cause of rollover, 1990-2005

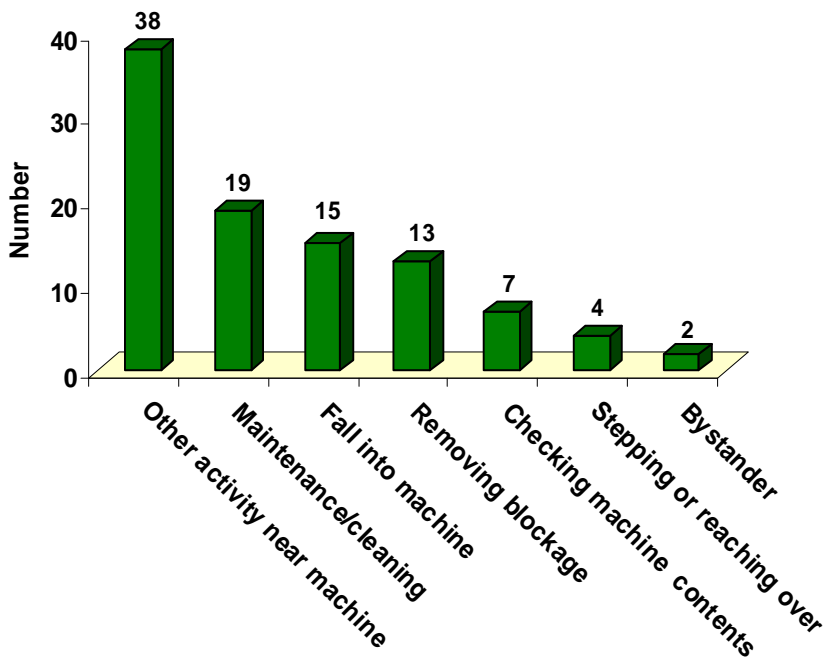
According to circumstance text descriptions, 24.0% of fatal backwards rollovers were due to improper towing (extraction) practices. Another 22.0% were the result of travelling on an incline, 20% were associated with dragging logs or implements, and 12.0% were the result of pulling stumps and trees. In 64.0% of the backwards rollovers overall, towing may have been a contributing factor. In 32.0% of the cases, a steep slope was either described in the circumstance text or was apparent from the location of occurrence.



5.18 Fatal entanglements in adults aged 15 to 59 by activity prior to entanglement, 1990-2005

Overall, circumstance text descriptions directly identify loose clothing or hair as the cause of 52.0% of the 102 fatal machine entanglements from 1990 to 2005.

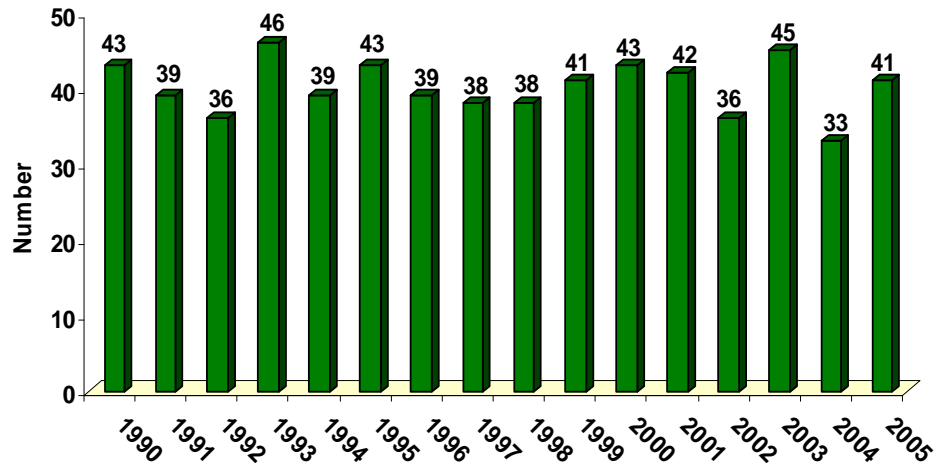
In 37.3% of the cases, victims were simply working too close to an entanglement hazard. In 18.6% of the cases, the victim had been cleaning or repairing a machine without shutting it off. In a further 14.7% of fatal entanglements, the decedent slipped and fell into a machine and in 12.7% he/she was removing a blockage while the machine was running. Only 2.0% of entanglement deaths were due to the actions of someone other than the deceased.



6 AGRICULTURAL FATALITIES IN CANADA: ADULTS AGED 60 AND OVER

6.1 Fatal agricultural injuries in adults aged 60 and over by calendar year, 1990-2005

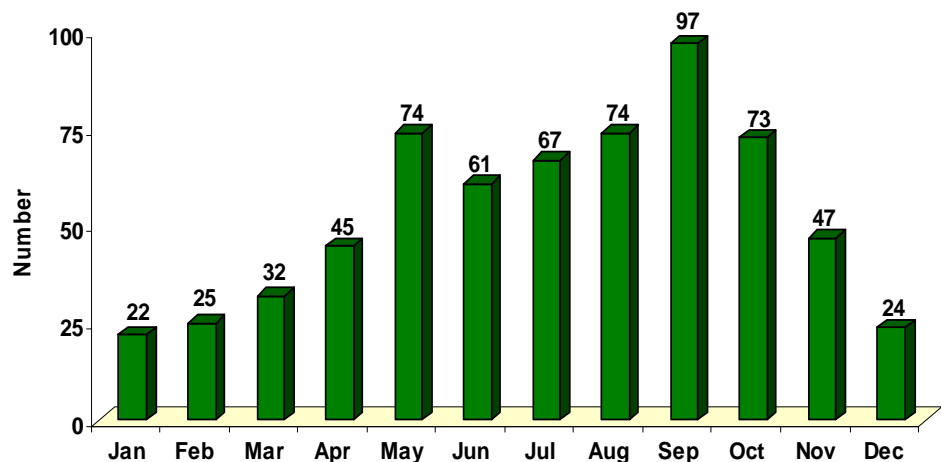
From 1990 to 2005, there were 642 agricultural fatalities among adults aged 60 and over. (An average of 40.1 per year.) The peak years for fatalities were 1993 and 2003. The average number of fatalities per year was 40.4 for the first eight years of the surveillance period, and 39.9 for the last eight years. There was no appreciable change in the average annual number of fatalities over the surveillance period.



6.2 Fatal agricultural injuries in adults aged 60 and over by month, 1990-2005

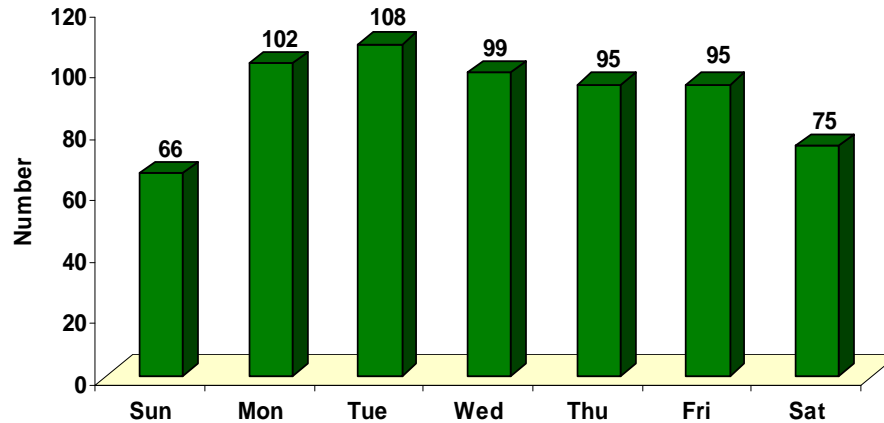
69.5% of all agricultural fatalities in adults aged 60 and over occurred from April to October.

There were two distinct peak periods for fatal injuries, May (11.5%) and August (11.5%), September (15.1%), and October (11.4%). Fewer older adults were killed from December to March.



6.3 Fatal agricultural injuries in adults aged 60 and over by weekday, 1990-2005

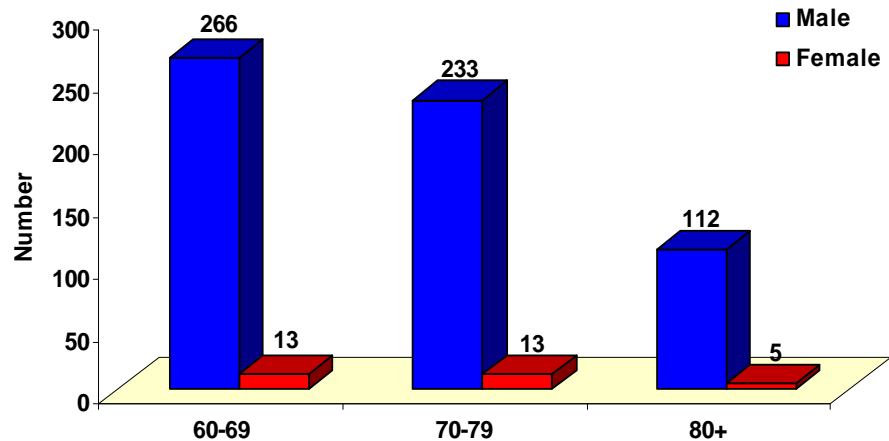
Fewer fatalities occurred on Sundays (10.3%) and Saturdays (11.7%) than on any other day of the week. The average proportion of fatalities that occurred on other days of the week was 15.5%.



6.4a Fatal agricultural injuries in adults aged 60 and over by age group and gender, 1990-2005

95.2% of the older adults killed in agricultural injury events were male. The ratio of males to females was lowest for the 70- to 79-year-old age group (17.9:1), and highest for the 80+ age group (22.5:1).

18.2% (117) of all older adults killed during agricultural work were males aged 80 or over. This accounts for the extraordinarily high fatality rate in the very elderly male farm population. Of these deaths, 78 (66.7%) involved farm work with tractors and other machines.



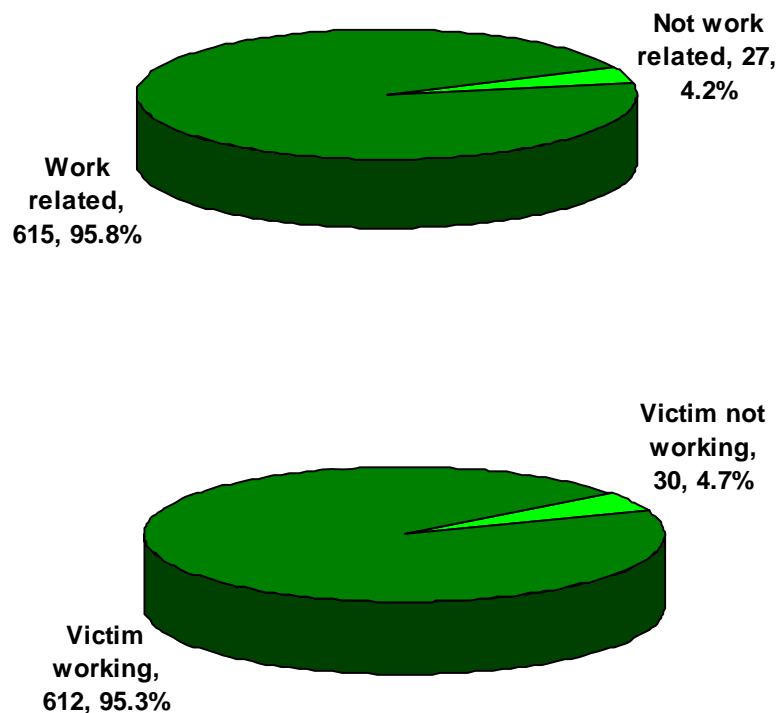
6.4b Fatal agricultural injuries in adults aged 60 and over by age group and gender, 1990-2005

The lower numbers of deaths recorded for the higher age ranges reflects the steady decline in the farm population with age (section 3.6).

Fatalities by age group and gender					
Age group	60-69	70-79	80+	Total	Percent
Male	266	233	112	611	95.2
Female	13	13	5	31	4.8
Total	279	246	117		
Percent	43.5	38.3	18.2		

6.5 Fatal agricultural injuries in adults aged 60 and over: the relationship to agricultural work, 1990-2005

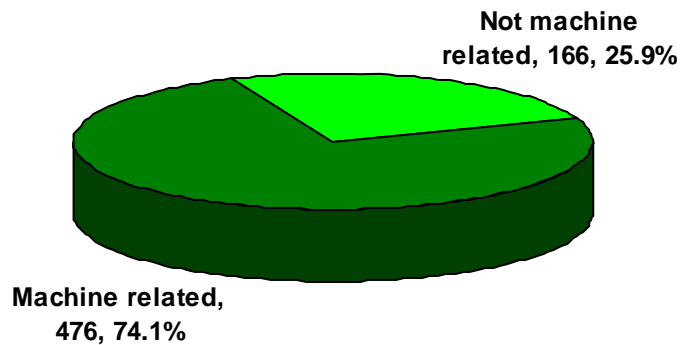
95.8% of the deaths in older adults were related to agricultural work. 95.3% of the older adults who died were themselves engaged in agricultural work. Both the proportion of work-related fatalities and fatalities where the victims were working were higher in adults aged 60 and over than in younger adults.



6.6 Fatal agricultural injuries in adults aged 60 and over by major cause, 1990-2005

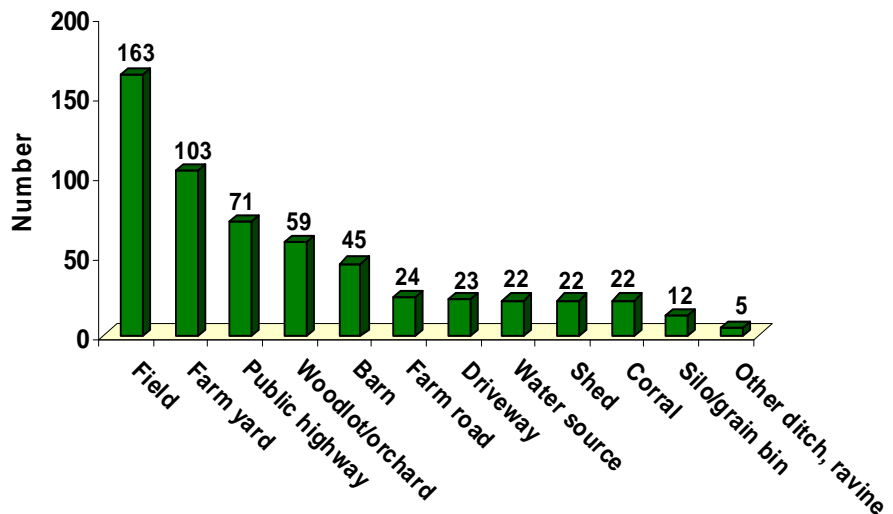
74.1% of agricultural fatalities in older adults were machine related. The proportion of machine-related injuries in older adults was 3.6% higher than for younger adults.

The leading machine-related mechanisms of injury were machine rollovers and machine runovers. Non-machine agricultural fatalities (25.9%) included animal-related events, being struck by an object and falls from height. (Figure 6.8).



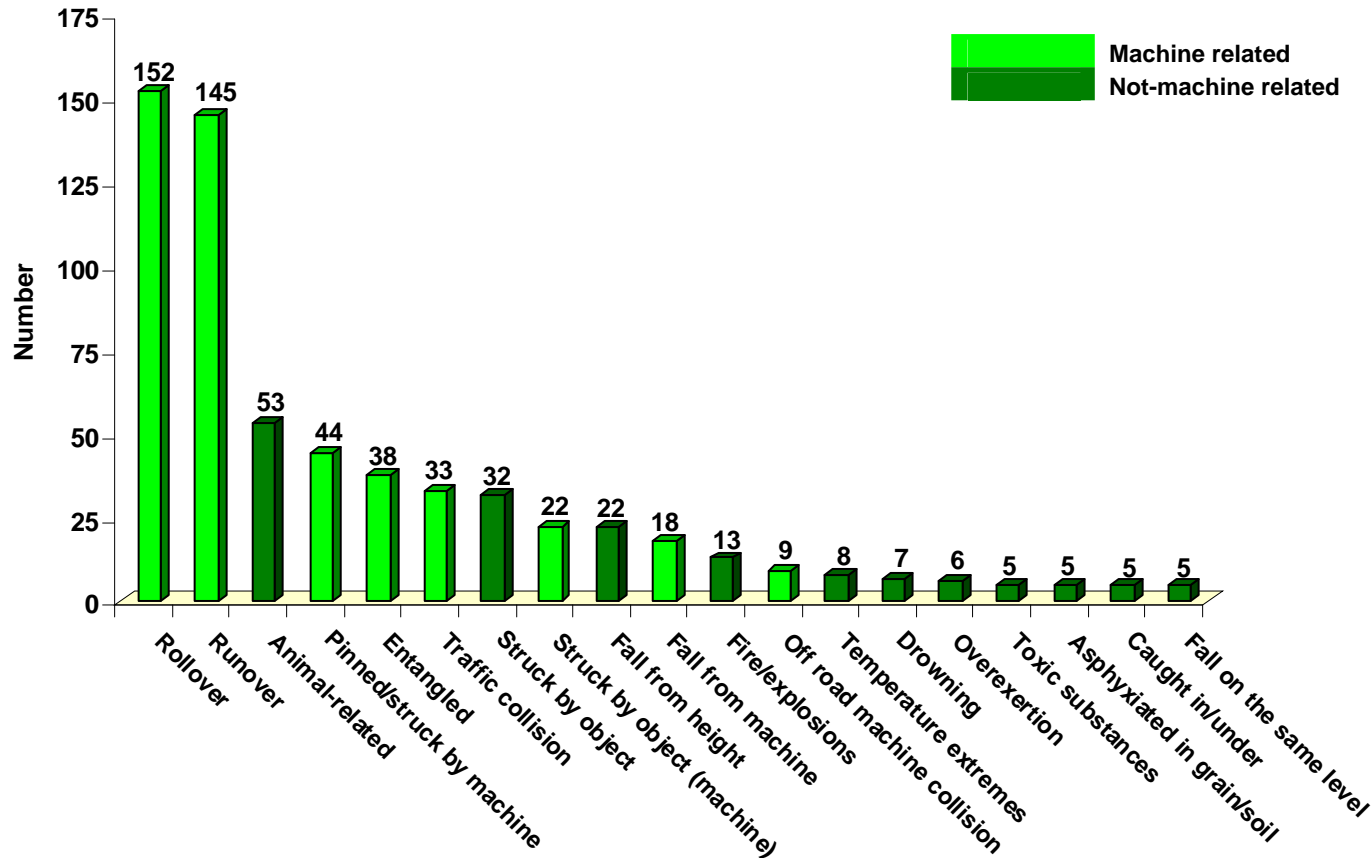
6.7 Fatal agricultural injuries in adults aged 60 and over by location of injury, 1990-2005

The most common locations of fatal injury for older adults were fields and their adjacent ditches (25.4%), farm yards (16.0%), public roads and their adjacent ditches (11.1%), woodlots (9.2%) and barns (7.0%). Public highways were a less common location of fatal injury in older adults (11.1%) than in younger adults (16.9%), whereas woodlots were a more frequent location of fatal injury for older adults than for younger adults (9.2% versus 6.5%).



Location was not known in 59 cases.

6.8 Fatal agricultural injuries in adults aged 60 and over by cause of injury, 1990-2005



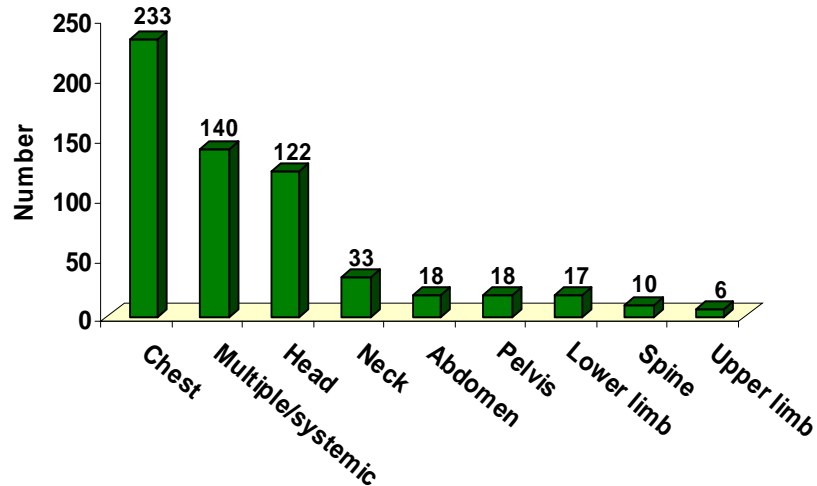
In adults aged 60 and over, 46.3% of all deaths were due to two main mechanisms of injury, machine rollovers (23.7%) and machine runovers (22.6%). The next most common mechanisms of fatal injury in older adults were being struck by an animal (8.3%), being pinned or struck by a machine (6.9%), machine entanglements (5.9%), traffic collisions (5.1%) and being struck by an object (5.0%). Older adults had a far higher proportion of animal-related fatalities (8.3%) than younger adults (4.1%). Also, in older adults the proportion of fatalities that were due to runovers (22.6%) was more than twice the proportion of fatalities due to runovers in younger adults (10.2%).

Another 15 machine-related and 5 non machine related cases with less than five fatalities per cause of injury were not included in the above figure.

6.9 Fatal agricultural injuries in adults aged 60 and over by body part injured, 1990-2005

In older adults, where the primary nature of injury was known, the chest was identified as the body part involved in 36.3% of the injuries that most probably caused death. Another 21.8% of the most serious injuries involved multiple body parts or systemic injuries like drownings. In a further 19.0% of cases, the head was cited as the body part involved in the primary injury.

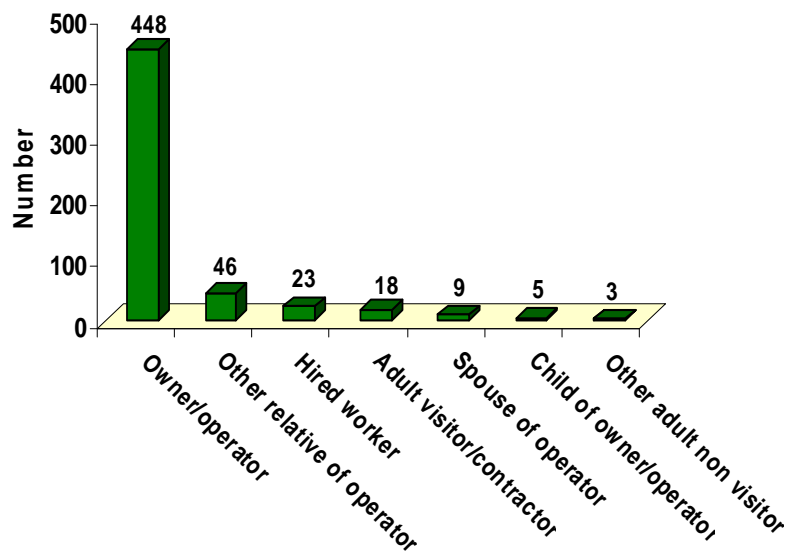
67.9% of the victims were injured so seriously that they either died at the scene or on the way to hospital.



The body part involved in the most important injury ('nature of injury 1') was not known in 45 cases.

6.10 Fatal agricultural injuries in adults aged 60 and over by relationship to farm operator, 1990-2005

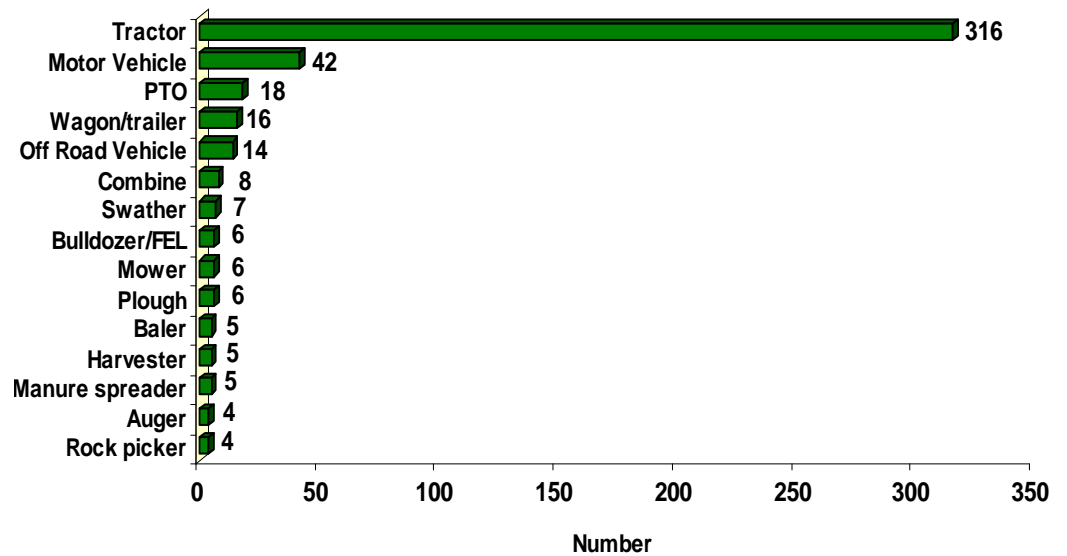
69.8% of older adults killed in agricultural injury events were farm operators. A further 7.2% of the victims were relatives of farm operators and 3.5% were hired workers. Only 2.8% were adult visitors or contractors.



Relationship was not known in 69 cases.

6.11 Fatal agricultural injuries in adults aged 60 and over by machine type, 1990-2005

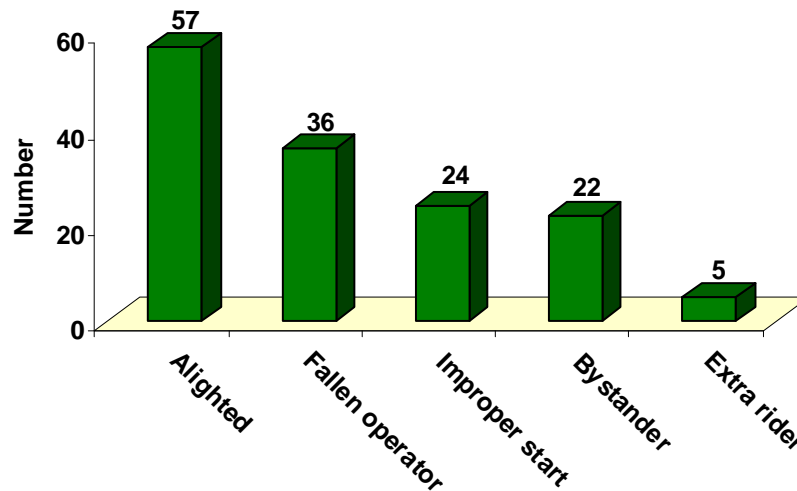
The types of machines most frequently involved in agricultural fatalities among older adults were tractors (66.4%), followed by motor vehicles (8.8%), PTOs (3.8%), wagons/trailers (3.4%), and off road vehicles (2.9%). The proportion of tractor-related deaths in adults aged 60 and over was 19.1% greater than for younger adults.



Other machine types: chain saw (1), airplane (1), other (7), and unknown (5).

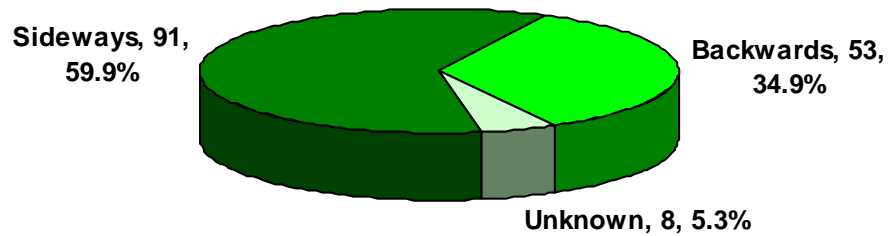
6.12 Fatal agricultural runovers in adults aged 60 and over by runover category, 1990-2005

In adults aged 60 and over there were 145 fatal runovers from 1990 to 2005. Most runovers involved unmanned machines which had been left running or left unblocked on a slope (39.3%). Operator runovers subsequent to falls from machines (24.8%) were the next most frequent runover mechanism followed by improper start runovers (16.6%). Bystander runovers (15.2%) and extra rider runovers (3.4%) were not common fatal runover mechanisms among older adults. The proportion of improper start runovers was much higher in older adults than in younger adults.



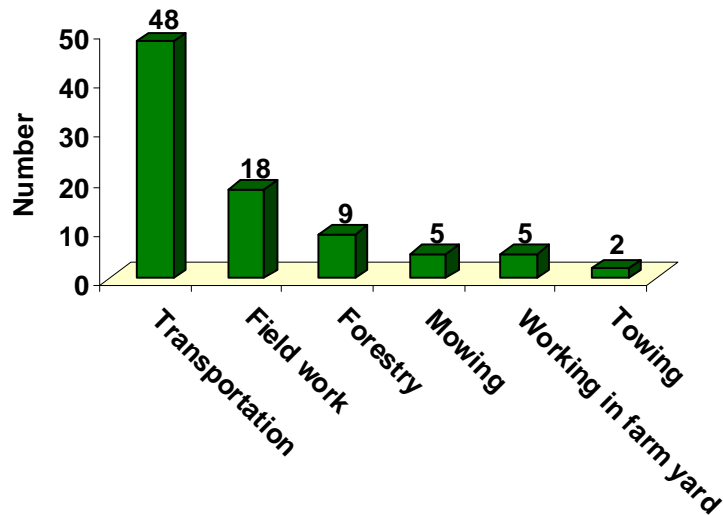
6.13 Fatal agricultural rollovers in adults aged 60 and over by rollover type, 1990-2005

In adults aged 60 and over, 59.9% of the fatal rollovers were sideways and 34.9% were backwards. Rollover direction could not be determined in 5.3% of the cases. Backwards rollovers were less frequent in younger adults (26.7%) than in older adults (34.9%). Most backwards rollovers occurred in woodlots.



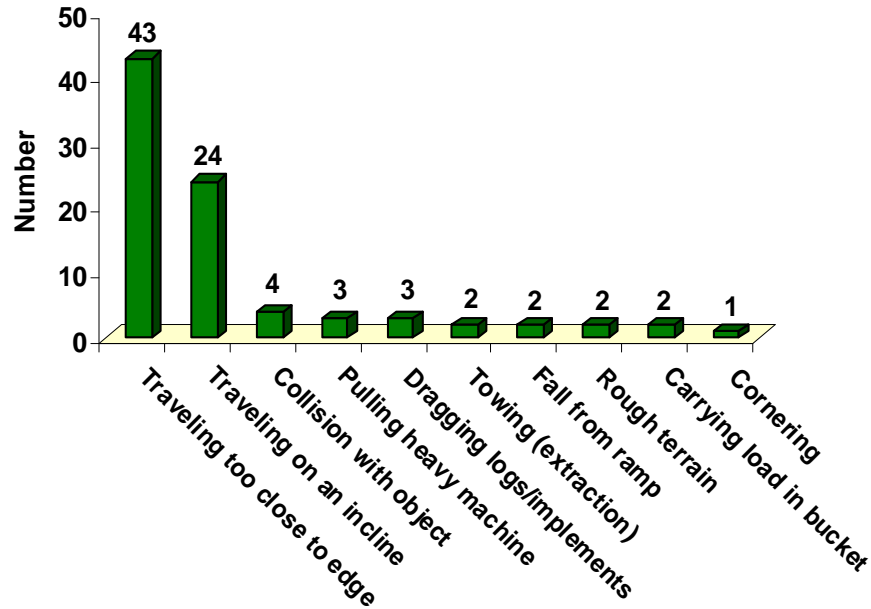
6.14 Fatal sideways agricultural rollovers in adults aged 60 and over by activity prior to rollover, 1990-2005

In fatal sideways machine rollovers, injury circumstance text descriptions showed that the decedents' most common activities prior to the rollover were driving on highways and farm roads (52.7%) and doing field work (19.8%).



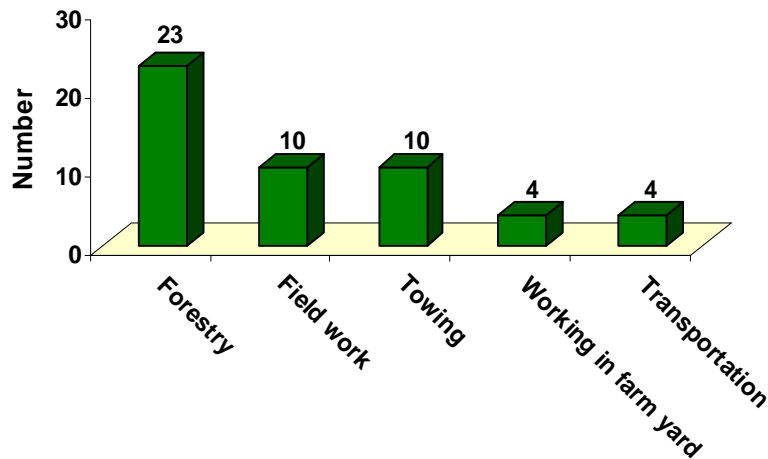
6.15 Fatal sideways agricultural rollovers in adults aged 60 and over by immediate cause of rollover, 1990-2005

According to circumstance text descriptions, in 47.3% of fatal sideways machine rollovers, the rollover most likely occurred because the machine or vehicle was travelling too close to the edge of a ditch or other steep slope bordering a road or field. In 26.4% of the cases, the rollover was attributed to the machine or vehicle travelling on a steep incline. In 24.2% of the rollovers overall, towing a machine or trailer may have been a contributing factor. Considering both circumstance text and location of occurrence, 72.5% of fatal sideways rollovers in older adults involved steep slopes such as ditches, ravines, ramps and embankments.



6.16 Fatal backwards agricultural rollovers in adults aged 60 and over by activity prior to rollover, 1990-2005

In fatal backwards machine rollovers among older adults, circumstance text descriptions indicated that the most common activities prior to the rollover were harvesting wood and maintaining woodlots (43.4%), towing (18.9%) and doing field work (18.9%).



6.17 Fatal backwards agricultural rollovers in adults aged 60 and over by immediate cause of rollover, 1990-2005

According to circumstance text descriptions, 18.9% of fatal backwards rollovers were due to improper towing (extraction) practices and 17.0% were attributed to traveling on an incline. Another 15.0% were associated with dragging logs or implements, and 15.0% were the result of pulling stumps and trees. In 13.2% of the cases the machine was backed over a steep slope. In 58.5% of the backwards rollovers overall, towing may have been a contributing factor. In 41.5% of the cases, a steep slope was either described in the circumstance text or was apparent from the location of injury occurrence.

