Purdue University
*Agricultural Safety and Health Program*

# 2020 Indiana Farm Fatality Summary with Historical Overview[1]

**Compiled by the Purdue University Agricultural Safety and Health Program**

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**Abstract**

Purdue University's Agricultural Safety and Health Program has been monitoring farm-related fatalities in Indiana for nearly 60 years. The earliest identified summary of cases, published in 1966, examined 76 fatalities reported during 1963.[2] Purdue's fatality database, though acknowledged as not being comprehensive of all farm-related deaths, provides a unique historical perspective to explore trends that have occurred over several decades, during which time agricultural production experienced a considerable reduction in the number of farms and, a transformation in technology and practices. Analysis of only recent fatality data, for example, fails to recognize that during the 1940's and early 1950's the leading identifiable cause of death was livestock, primarily horses and bulls. These animal-related injuries and deaths have largely been replaced, at a much lower frequency, with tractors and machinery. The fatality data, as shown in this report, continues to show a general downward trend that parallels the decline in the number of farm operations, which has likely contributed more to the reduction in farm-related fatalities than any other single factor.[3] This is in light of the fact that Indiana farmers have become more productive than ever. The farm-related fatality rate, however, remains one of the highest of all Indiana occupations.

Publication of the annual summary is viewed as a tool in keeping the public aware of the fact that our food comes at a cost of lives, health and well-being of farm families that is not generally included in the prices we pay at the grocery store or farmer's market.

The 25 documented cases in 2020 is an increase from the 21 fatalities identified in 2019 but reflects the continuing historical trend of a declining number of annual fatalities. However, four of the previous six years actually exceeded the 10-year average of 27.2 fatalities per year. Two victims were under the age of 21, and 14 victims were age 60 and older, including 6 over the age of 70. Incidents involving those 60 and older now account for nearly half of all documented cases over the past five years, including 52% in 2020. Tractor-related incidents still comprise the largest portion of fatalities, representing as many as 75% of all documented

[1] Appreciation is extended to Executive Director Stacy Wart, BLS Coordinator Joseph Black, and Survey Assistants Richard Clark and Rhapsody Owens with the Indiana Department of Labor Quality Metrics & Statistics Division for contributing to this report.
[2] Mitchell, Bailey W. (1966) Indiana Farm Accident Report 1963-1965. Purdue University, West Lafayette, IN.
[3] Data from USDA National Agricultural Statistics Service
https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=INDIANA
https://www.nass.usda.gov/Statistics_by_State/Indiana/Publications/Annual_Statistical_Bulletin/index.php

cases in some years. Over the past 50 years, tractor overturns have accounted for the single largest cause of farm-related deaths, even considering that Rollover Protection Structures (ROPS) have been standard equipment on new tractors since 1985. In 2020, there were 9 documented tractor-related fatalities that involved 2 tractor overturns and 3 tractor runovers. Findings suggest that over the last decade the diversity of agents involved in farm-related fatalities has been increasing. There were four documented farm work-related utility vehicles (UTV) fatalities in 2020. Males continue to comprise a large majority of farm-related fatalities (92%), and the average age of all victims was 61.1, older than the current average age of Indiana farmers of 55.5.[4] One female fatality were documented in 2020, after 5 females lost their lives on Indiana farms in each 2017 and 2018. Amish/Old Order communities in the state still account for a disproportionate share of farm-related deaths. Hazards identified as needing special attention include the use of older, non-ROPS equipped tractors and self-propelled mowers on steep grades; working in wood lots and tree felling on farms; ATV and UTV operation on farms; working with livestock, including horses and bulls; and extra riders on equipment. Findings are being used to guide the allocation of injury prevention resources.

**Methods of Data Collection**

The 2020 Indiana Farm Fatality summary was compiled by Purdue's Agricultural Safety and Health Program from a variety of sources, including published news reports, web searches, voluntary reporting from Extension educators and others, and voluntary feedback from witnesses, family, or responders. No additional cases were identified from sources outside of the state, including federal government sources such as the Census of Fatal Occupational Injuries or Bureau of Labor Statistics, or AgInjuryNews.org. Data were compared with findings by the Indiana Department of Labor and adjusted to reflect differences due to data interpretation, data collection sources, and occupational classification. There is no claim made that the presented data are comprehensive but rather represent the best assessment currently available.[5]

There is no requirement, in Indiana, to report farm-related injuries or fatalities to a central location, as is mandated for most other industry classifications under the provisions of the Occupational Safety and Health Administration (OSHA). Currently, there are no known efforts being made nationally to enhance the quality of Indiana farm-related fatality and injury statistics beyond the level of reporting found in these annual summaries. The Bureau of Labor and Statistics maintains records on fatalities in farming for all states, but that set of data combines farming, fishing, forestry, and hunting fatalities, and often excludes incidents on smaller farm operations, children involved in farm-related activities, or unpaid family workers. In other words, the actual frequency of these incidents continues to be underreported.

It should be noted that several other Midwestern states no longer have the capacity to document and report on these incidents beyond the limited data available from the Census of Fatal Occupational Injuries, which has historically underreported farm-related fatalities. Some key agricultural states have eliminated or diminished their land grant university-based farm safety efforts and, due to prohibitions in federal appropriation language, federal and state OSHAs have generally maintained a hands-off approach to most agricultural production sites.

There were slight differences in reporting of fatalities between Purdue and the Indiana Department of Labor due to variances in how workers and events are classified. For example, the Purdue summary has traditionally excluded most motor vehicle crashes which do not involve transport of agricultural equipment or crops, or that could not be specifically linked to farm work-related activities. Children involved in farm work have also been historically included in the Purdue report, whereas they may not be in the Department of Labor summary due to their classification as non-employees. As noted by the annual Census of Fatal Occupational Injuries, deaths on Indiana farms have had a long history of representing a disproportionate share of the state's workplace fatalities. The most recent data from the Indiana Department of Labor documented 18 fatalities in 2018 and classified agriculture as the state's second most hazardous industry.[6]

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[4] Data from Indiana State Department of Agriculture https://www.in.gov/isda/3555.htm

[5] Differences may be found in reporting of prior years due to the addition of previously unidentified cases to the database.

[6] https://secure.iot.in.gov/dol/files/CFOI_2019.pdf

**Description of 2020 Farm-related Fatalities**

Description, dates, and locations of the 25 fatalities documented as agricultural workplace incidents are provided in Table 1. Again, it should be noted that the list may not be comprehensive due to the lack of consistent reporting requirements, Indiana residents transported to and dying at medical facilities in neighboring states, and victims dying after the injury event due to related medical complications. The list does not include fatalities to farmers due to motor vehicle crashes involving farm vehicles (unless determined to occur when conducting farm work tasks), conditions such as heart attacks or heat stress that were not directly attributed to work activities, or medical complications from workplace health hazards such as chronic pesticide exposure. Little or no accessible data exists on the impact these agents, including agricultural chemicals, have on Indiana farmers and farm workers.

Table 1. Description of documented 2020 farm-related fatalities

| Date | County | Age | Sex | Description |
|---|---|---|---|---|
| 1/6 | Wabash | 66 | M | Grain bin entrapment |
| 1/2 | Miami | 77 | M | Tractor runover |
| 1/4 | Noble | 62 | M | Crushed by tractor |
| 1/6 | Johnson | 56 | M | Trench collapsed |
| 2/3 | White | 57 | M | Grain truck crash |
| 2/3 | White | N/A | M | Grain truck crash |
| 3/16 | Steuben | 69 | M | Fall in barn |
| 3/30 | Dubois | 55 | M | Off road vehicle overturn |
| 5/7 | Fulton | 89 | M | Caught in blueberry harvesting machine |
| 6/1 | Bartholomew | 96 | M | Tractor overturn |
| 6/3 | Warrick | 69 | M | Tractor runover |
| 6/3 | Sullivan | 81 | M | Farming incident |
| 6/6 | DeKalb | 68 | M | UTV-motor vehicle collision |
| 6/24 | Parke | 70 | M | Tractor overturn |
| 6/30 | Franklin | 69 | M | Barn fire |
| 7/7 | LaPorte | 26 | M | Heat stroke |
| 7/17 | Gibson | 55 | M | Fell from tractor |
| 8/11 | Putnam | 93 | M | UTV-motor vehicle collision |
| 8/25 | Clay | N/A | M | Farm machinery incident |
| 9/24 | Tipton | 49 | M | Grain truck crash |
| 10/9 | Brown | 76 | M | Tractor runover |
| 10/16 | Dubois | 60 | F | UTV-motor vehicle collision |
| 11/21 | Jasper | 17 | N/A | Tractor-motor vehicle collision |
| 11/21 | Jasper | 16 | N/A | Tractor-motor vehicle collision |
| 12/30 | Morgan | 29 | M | Silo collapsed |

**Summary of Findings**

Twenty-five farm-related fatalities were documented in Indiana during 2020. This is 16.4% lower than the average number of fatalities documented annually since 1970 (29.9). As shown in Figure 1, the lowest number ever documented in the last 51 years was 8 in 2006. The highest numbers documented in the last 50 years were 54 in 1981, 49 in 1990 and 44 in 2016. Though the total average number of annual fatalities over that 50-year time span has continued downward, spikes in 2016, 2017, and 2018 slowed that encouraging trend.

The frequency of these events has been rather erratic over the years, but as previously indicated, there has been an overall decline in the average annual number of fatal incidents. It should be recognized that during early years incidents were less likely to be documented due to limited access to records such as online sources, making the decline even more noteworthy.

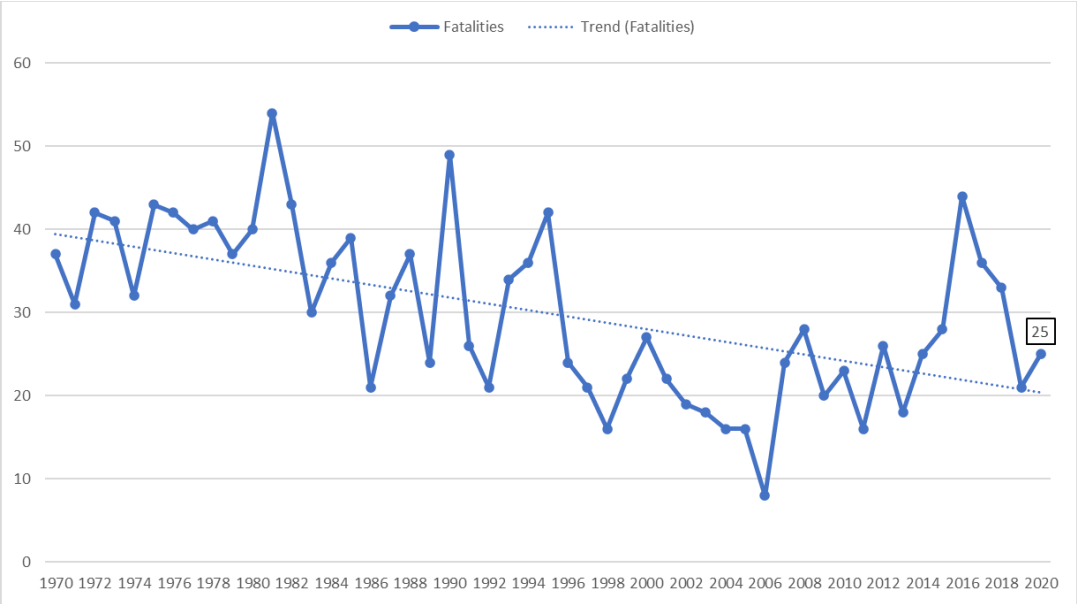


Figure 1. 51-year summary of farm-related fatalities: 1970-2020

No specific factor(s) has been identified that has contributed to the reoccurring spikes (or declines) in frequency. Other than incidents involving tractors and farm machinery, agents of injury have varied widely. This lack of consistency makes targeting limited prevention resources difficult, except for tractor-related incidents. The continued occurrence of tractor-related incidents such as overturns and runovers indicates that a greater focus on the value of Rollover Protection Structures (ROPS) - especially on tractors used for mowing - could prove beneficial.

The age of the victims in 2020 ranged from 26 to 96 and averaged 61.1, which is substantially higher than the average age of Indiana farmers, currently at 55.5. A true comparison cannot, however, be made since the pool of farmers included to determine the average age does not include children under the age of 18. Historically, farmers over the age of 60, including many who work only part time, have accounted for a disproportionate number of farm-related injuries. Recent spikes in frequencies of fatalities over the past 10 years makes this population of older farmers a special concern.

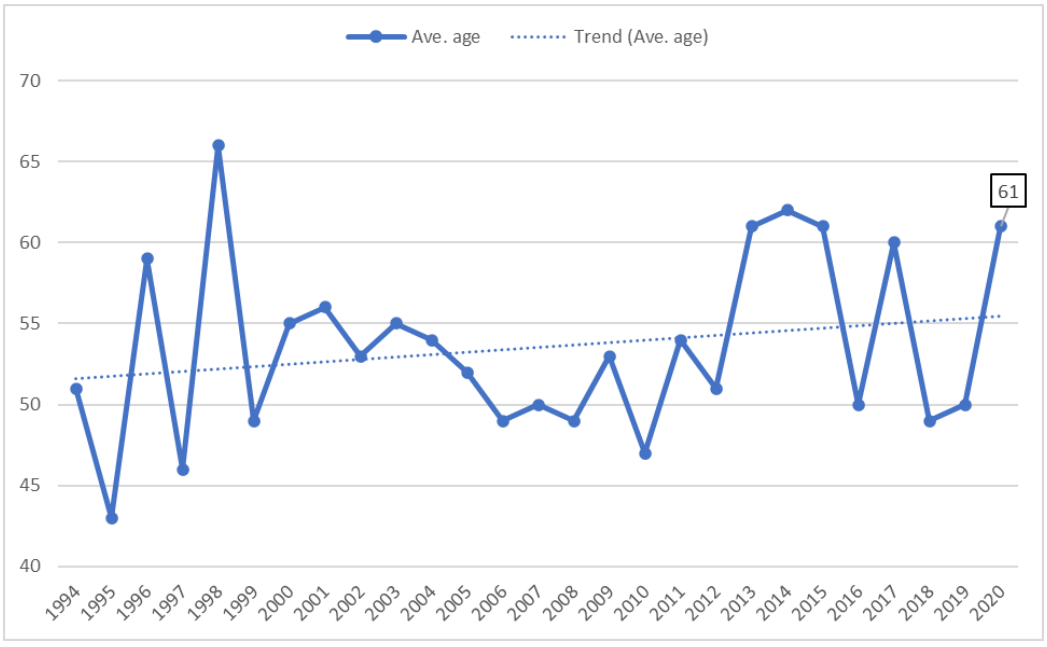


Figure 2. Average age of farm-related fatalities 1994-2020

Two fatalities involving children and youth, under the age of 18, were documented in 2020. Both were involved in the same tractor/motor vehicle incident. This age group accounted for 8% of the total fatalities.

The historical data show an overall decline in the frequency of farm-related fatalities involving children and youth under the age of 18, who have historically accounted for a disproportionate share of total farm deaths. In some early years nearly one third of fatalities were children and youth.

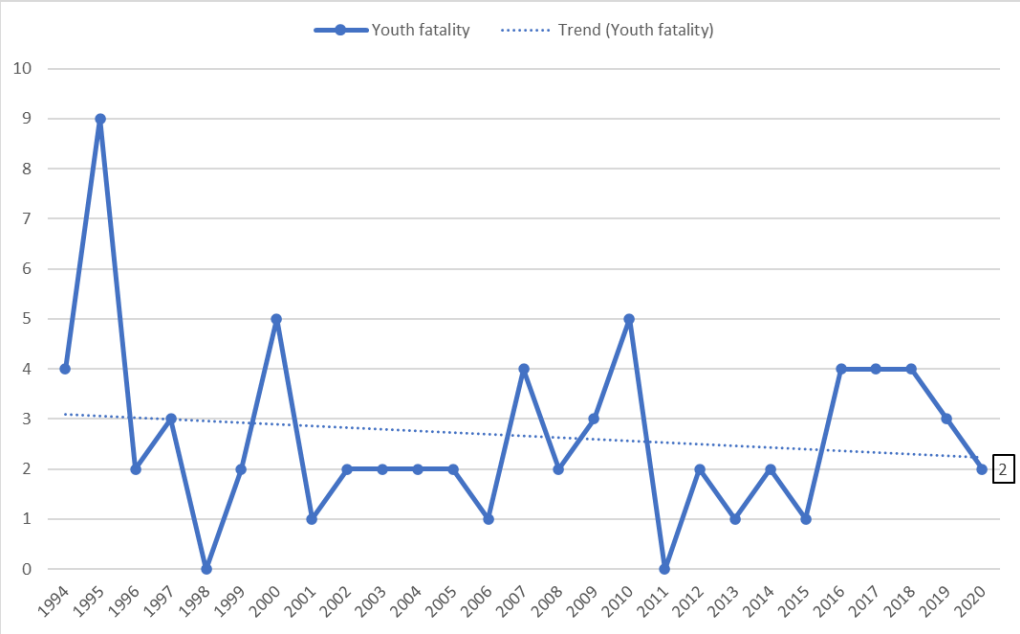

Figure 3. 51-year summary of youth farm-related fatalities: 1970-2020

The overall historical decline in the number of children being reported as dying in agricultural workplaces is extremely encouraging. As such, it is hoped that the slight increase in the number of younger victims over the past five years is a statistical outlier. It is believed that the changing expectations of parents and the general public towards having children and youth employed in some types of farm work considered especially hazardous has had a significant influence on the continuing downward trend in fatalities involving this group. There may also be greater compliance with child safety related regulations, including the Hazardous Occupations Order for Agriculture. The introduction of larger, more complex and expensive equipment has also made many producers less comfortable using young or inexperienced workers to operate it.

It was anticipated by the authors that the impact of the COVID pandemic might increase the frequency of fatalities involving children and youth because more farm children were not attending school or were being home schooled. It appears that the potential increased exposure to farm-related activities during this time did not result in additional fatalities.

Table 2 summarizes documented incidents during the period 1994 to 2020 involving youth and those 60 and older. During those 27 years, there were no fewer than 654 fatalities of which 72 were under the age of 18 and 387 were age 60 and older. Again, these two groups have historically represented a disproportional share of the total deaths, accounting for nearly 59% of the total. In 2020, these two age groups accounted for 60% of documented fatalities.

Table 2. Analysis of "youth" and "over 60" fatalities as percent of total farm-related fatalities

| Year | Deaths Ages 1-17 | Youth Deaths as % of Total | Deaths Age 60+ | Over 60 Deaths as % of Total | Deaths of Both Youth & Over 60 | Percent of Both Youth and Over 60 Deaths | Average Age of Victim | Total Farm-Related Fatalities |
|---|---|---|---|---|---|---|---|---|
| **2020** | **2** | **8%** | **13** | **52%** | **15** | **60%** | **61** | **25** |
| **2019** | 3 | 14% | 11 | 52% | 14 | 66% | 50 | 21 |
| **2018** | 4 | 12% | 16 | 48% | 20 | 61% | 49 | 33 |
| **2017** | 4 | 9% | 18 | 50% | 22 | 61% | 60 | 36 |
| **2016** | 4 | 11% | 15 | 33% | 19 | 42% | 50 | 44 |
| **2015** | 1 | 4% | 16 | 57% | 17 | 61% | 61 | 28 |
| **2014** | 2 | 8% | 17 | 38% | 19 | 76% | 62 | 25 |
| **2013** | 1 | 6% | 10 | 56% | 11 | 61% | 61 | 18 |
| **2012** | 2 | 8% | 9 | 35% | 11 | 42% | 51 | 26 |
| **2011** | 0 | 0% | 8 | 50% | 8 | 50% | 54 | 16 |
| **2010** | 5 | 22% | 9 | 39% | 14 | 61% | 47 | 23 |
| **2009** | 3 | 15% | 12 | 60% | 15 | 75% | 53 | 20 |
| **2008** | 2 | 7% | 11 | 39% | 13 | 46% | 49 | 28 |
| **1994-2007** | 39 | 17% | 150 | 42% | 189 | 58% | 53 | 311 |
| **Total/ Average** | **72** | **11%** | **315** | **48%** | **387** | **59%** | **54** | **654** |

Table 3 highlights 27 years of tractor-related fatality data. During these years, tractors accounted for 287 or 44% of the total of all Indiana fatalities. The most frequent incident involved tractor upsets or overturns followed by runovers. There appears to be a trend toward fewer tractor-related fatalities, while the overall causes of farm fatalities become more diverse.

Table 3. History of Indiana tractor-related fatalities

| Year | Number of Tractor-Related Fatalities | Number of All Farm Fatalities | Percent of Tractor Related Fatalities in Total Fatalities |
|---|---|---|---|
| **2020** | **9** | **25** | **36%** |
| **2019** | 8 | 21 | 38% |
| **2018** | 12 | 33 | 36% |
| **2017** | 13 | 36 | 36% |
| **2016** | 16 | 44 | 36% |
| **2015** | 11 | 28 | 39% |
| **2014** | 13 | 25 | 52% |
| **2013** | 6 | 18 | 33% |
| **2012** | 12 | 26 | 46% |
| **2011** | 6 | 16 | 38% |
| **2010** | 11 | 23 | 48% |
| **2009** | 11 | 20 | 55% |
| **1994-2008** | 159 | 339 | 47% |
| **Total** | 287 | 654 | 44% |

With approximately 55,500 productive farms in Indiana, it was estimated that in 2020 one out of every 2,220 farms experienced a farm-related fatality.[7] Using a population of 139,000 operators and hired workers on farms in Indiana, the death rate was approximately 18 per 100,000 farm workers.[8] Indiana is often referred to as an agricultural state, although less than 1% of the workforce is employed in production agriculture. However, the agriculture industry has traditionally been responsible for one of the highest annual number of work-related fatalities in the state (Indiana Department of Labor, 2018). The estimated fatality rate of 18 per 100,000 Indiana farm workers in 2020 compares to an estimated national death rate of 3.5 per 100,000 for full-time workers in all industries and approximately 22.8 per 100,000 for those engaged in agricultural production nationwide.[9]

It is believed, however, that the Indiana and national agricultural farm-related fatality rates would be lower if unpaid family laborers were included in the population classified as being exposed to farm hazards on a regular basis. For example, older family members may still be regularly engaged in farm work but are not considered as employed labor in order to meet Social Security eligibility requirements. As noted, those 60 and older accounted for 52% of the reported fatalities in 2020, implying that the agriculture workforce over the age of 60 is higher than most other occupations. Furthermore, the National Safety Council data and the Census of Fatal Occupational Injuries historically have not included children under 16 in their calculation of rates, while Purdue's Agricultural Safety and Health Program does if the child was involved with or exposed to farm-work activities.

Figure 4 shows the distribution of documented farm-related fatalities over the past 40 years when the county of location was known. Every county in the state has experienced multiple documented farm fatalities. Counties with the highest number of documented cases are as follows:

- Elkhart-35
- LaGrange-31
- St. Joseph-24
- Dubois-24
- Greene-23
- Franklin-21
- Daviess-19
- Dearborn-19
- Adams-18

Elkhart and LaGrange counties are home to the state's largest Amish/Old Order populations. These groups have historically accounted for a disproportionate share of farm-related fatalities. In one recent annual summary, Amish/Old Order farmers and family members accounted for approximately one-third of all documented fatalities. The continued use of horses as a primary power source, bulls for breeding, older machinery that lacks current guarding provisions, and the greater number of children engaged in farm work are significant contributors to higher frequencies of fatalities in this community.

[7] Estimated number of farms from the final report of the USDA/NASS 2020 State Agriculture Overview for Indiana. https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=INDIANA

[8] Estimated farm population of producers and hired workers on farms from the final report of the 2017 U.S. Census of Agriculture. This number does not include unpaid family labor such as retired family members and children.

[9] Estimated death rates from the U.S. Bureau of Labor Statistics (2018). https://stats.bls.gov/iif/oshcfoi1.htm

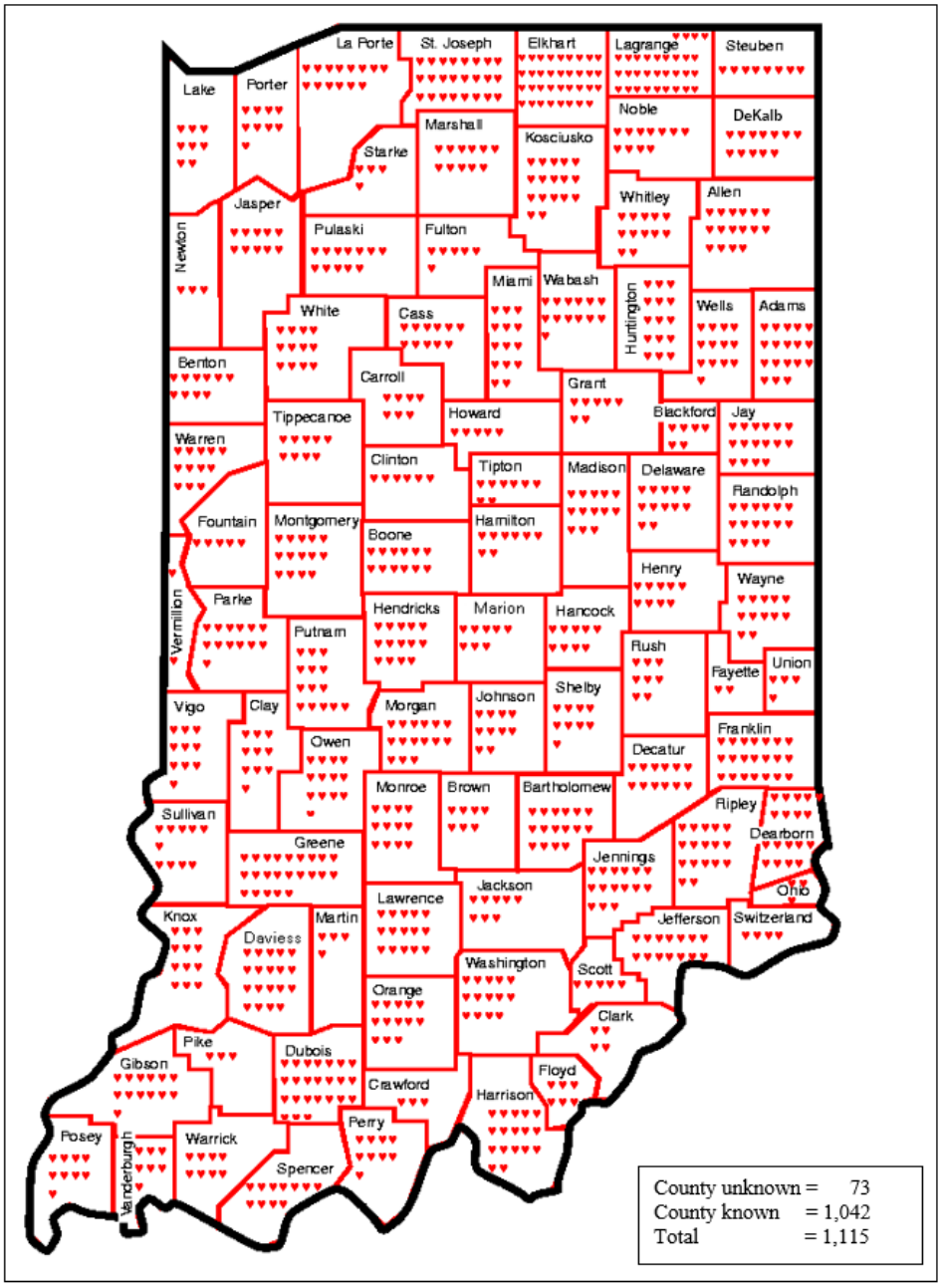


Figure 4. Geographic distribution by county of Indiana's farm-related fatalities from 1980 through 2020

**Monthly Distribution of Farm Fatalities**

During the 1970's and 1980's, the clear peak month for farm work-related fatalities was October, which is typically the primary grain harvesting period in Indiana.[10] More recently, the monthly distribution of fatalities has flattened. Over the past ten years, the months with the highest number of fatality incidents have been June and September. It appears that the push for earlier harvest, possibly coupled with changing technology and work practices, has resulted in an earlier peak in the number of fatalities.

[10] Summary of Indiana's Farm Work-Related Fatalities for 1980-1989 with Comparisons to 1970-1979, National Institute for Farm Safety presentation, June 17-21, 1990, Wilkinson and Field

**Summary of Indiana's Farm-Related, Non-Fatal Incidents and Their Economic Impact**

While the Purdue Agricultural Safety and Health Program attempts to be thorough in its surveillance of farm work-related fatalities, farm-related non-fatal injuries are not well documented by any source in the state. As a result, there is little data on the frequency, severity, and causes of injuries that occur annually during farm work. However, the relatively few Indiana non-fatal farm-related injuries that were identified in 2020 as part of the fatality surveillance efforts were generally severe. Several of the incidents resulted in loss of a limb, spinal cord or head injuries, and/or involved the use of medical helicopters for transport to a trauma center.

It is estimated, based upon prior research, that approximately one out of every nine Indiana farms annually experiences a farm-work-related injury requiring medical attention. Based upon the estimated 55,500 farms in the state, it can be extrapolated that in 2020 there were approximately 6,167 treated injuries. Prior research by the National Safety Council indicated that 2% of reported farm injuries result in permanent disability. Applying the 2% estimate to Indiana's estimated 6,167 injuries, approximately 123 such cases occurred in the state in 2020. Most non-fatal farm injuries, however, are never reported in the media, and there is no requirement to report such incidents, including severe injuries, to any official agency. The need remains for a more comprehensive trauma registry that includes farm-related injuries. Such a record would be helpful in targeting prevention efforts toward high-risk activities. A sample of incidents resulting in serious injuries is found in Table 4.

Table 4. Description of selected 2020 farm-related injuries

| Date | County | Age | Sex | Description |
|---|---|---|---|---|
| 1/21 | Elkhart | 52 | M | Skid steer loader - motor vehicle collision |
| 1/21 | Elkhart | 4 | M | Skid steer loader - motor vehicle collision |
| 4/9 | Vanderburgh | N/A | M | Farming incident |
| 4/22 | Dubois | 66 | F | Tractor overturn |
| 7/12 | Clinton | N/A | N/A | Tractor-motor vehicle collision |
| 7/12 | Clinton | N/A | N/A | Tractor-motor vehicle collision |
| 8/19 | Allen | 63 | M | Tractor overturn |
| 9/25 | Kosciusko | N/A | M | Grain bin entrapment |
| 10/10 | Elkhart | 8 | M | Struck by tractor trailer |

An issue that creates significant hardships for both Indiana farm families and hired farm labor is that most are not covered by, nor can they afford, state workers compensation insurance programs that nearly all employees of other Indiana industries have available to them. Therefore, an on-the-job injury or illness can result in both excessive personal debt due to medical costs and long-term loss of income. In some cases, the anticipated costs may discourage injured workers from seeking needed medical attention.

The lack of both affordable health care insurance and insurance for lost wages due to injury in the agricultural sector are complex public policy issues that still need attention to ensure that the economic impact of work-related injuries on the state's farm families and agricultural workforce is minimized. Recent legislative changes have increased access to affordable health care insurance options for some farm families, but enrollment remains low.

**Impact of COVID Pandemic**

The impact of the COVID-19 pandemic on farm families in the state is unknown. There was no accessible data that would suggest that the risk to farm families was more or less than for other population groups. While the inability to obtain needed respiratory protection for farm workers was documented as a problem, the risks may have been offset by the nature of much farm work to be conducted alone or in open spaces reducing the probability of being exposed. There is evidence to suggest that the death rate from COVID may have been higher within the Amish/Old order communities.

**Summary of Amish/Old Order Buggy-related Incidents**

Table 5 describes nine documented collisions between Amish buggies and motor vehicles in 2020. These events resulted in two fatalities and 12 injuries, several of which were life-threatening. Five incidents involved two or more injuries each. Individuals involved ranged from 7 to 54 years of age.

Table 5. Description of 2020 Amish buggy-related incidents

| Date | County | Gender | Age | Fatal | Description |
|---|---|---|---|---|---|
| 2/18 | Lawrence | F | 21 | N | Buggy and motor vehicle collision |
| 2/18 | Lawrence | M | 7 | N | Buggy and motor vehicle collision |
| 6/9 | Adams | F | 54 | Y | Buggy and motor vehicle collision |
| 6/19 | Allen | N/A | N/A | N | Buggy and motor vehicle collision |
| 7/1 | Jay | M | 21 | Y | Buggy and motor vehicle collision |
| 7/1 | Jay | F | 19 | N | Buggy and motor vehicle collision |
| 8/30 | Elkhart | M | N/A | N | Buggy and motor vehicle collision |
| 8/30 | Elkhart | N/A | N/A | N | Buggy and motor vehicle collision |
| 8/30 | Elkhart | N/A | N/A | N | Buggy and motor vehicle collision |
| 8/30 | Elkhart | N/A | N/A | N | Buggy and motor vehicle collision |
| 8/30 | Elkhart | N/A | N/A | N | Buggy and motor vehicle collision |
| 12/23 | Orange | F | 23 | N | Buggy and motor vehicle collision |
| 12/23 | Orange | F | 21 | N | Buggy and motor vehicle collision |
| 12/23 | Orange | F | 31 | N | Buggy and motor vehicle collision |

From 2015 to 2020, 152 buggy-related crashes were documented in Indiana, resulting in 15 fatalities. Most of the incidents involved a collision between a motor vehicle and a buggy, and many resulted in multiple victims. Documented ages of victims ranged from 1.5 months to 82 years, with victims under the age of 21 accounting for 56.5% of the cases where victim ages were reported. It should be noted that this type of occurrence is under reported and access to incident reports may be difficult to obtain. There is a need to give more attention to incidents involving Amish/Old Order horse-drawn vehicles on public roadways, as well as farm work-related injuries among these populations.

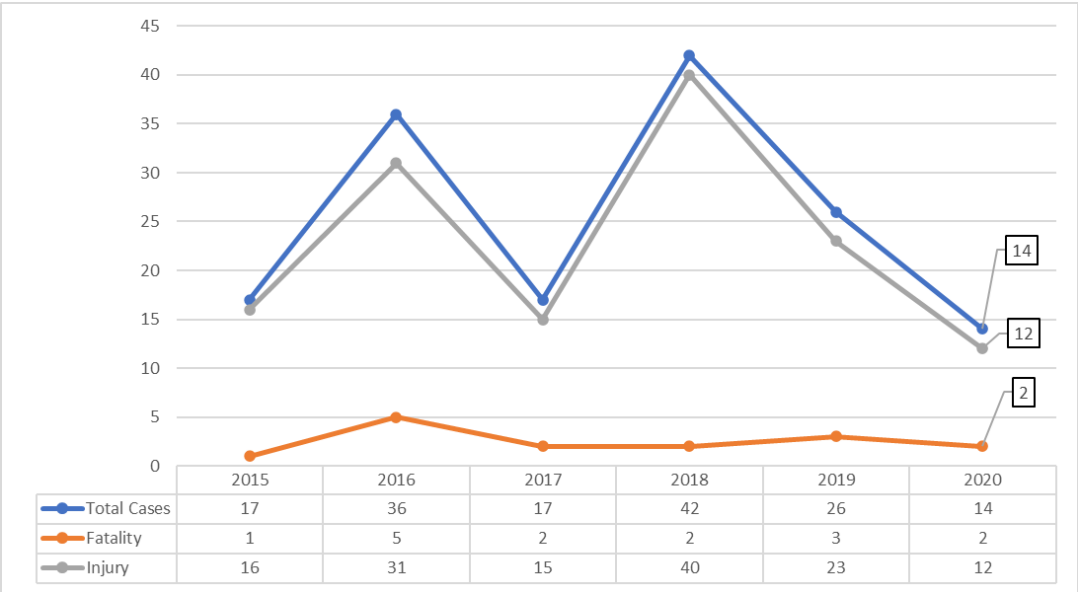


**Figure 5. Amish buggy-related incidents, 2015-2020**

**Fatal Injuries Involving Wood Cutting on Farms**

Farmers over 55 years of age are at high risk of both fatal and non-fatal injuries related to occasional wood cutting activities, such as trimming, cutting and removing of trees and tree limbs. From 1988 to 2017, there were 40 documented wood cutting related fatalities involving farmers 55 year or older, which represented 10.3% of all farm-related fatalities to individuals over 55 years old. During 2019, at least two wood cutting

fatalities were documented on Indiana farms, with victim ages of 37 and 82. In 2020, there were no wood cutting fatalities reported, but non-fatal injuries were documented.

Historically the most common specific cause of wood cutting injury was being crushed by a tree or tree limb. These types of incidents are preventable, and the role of aging should be considered as one of the most significant contributing factors. Prevention strategies should address: 1) the factors associated with aging and working alone in the woods, 2) the risks of tree felling, 3) the use of personal protective equipment, and 4) the hazards involved with operating tractors in wooded areas.

**The Changing Agricultural Workforce**

The increasing number of small farms is an important change occurring in rural communities. These audiences of part-time "hobby" or small highly diversified farmers have very different educational needs as compared to larger commercial operations. A review of fatality data over the last few years suggests that these smaller operations account for a disproportionate share of all documented fatalities, as compared with larger or full-time operations. A significant contributing factor is the use of older, less safe machinery on these smaller operations, especially older tractors without ROPS. In some cases, horses are being considered as a "greener" alternative to tractors, without recognition that horses were once the leading cause of farm-related fatalities.

The recent claims regarding the increasing numbers of women engaged as owner/operators of Indiana farms cannot be proven by any significant increase in the number of women dying or being injured as the result of being involved in farm work. Historically over 95% of all farm workplace fatalities have been male. Considering that an estimated 5,600[11] principal farm operators in Indiana are female, it could be expected that there would be a larger number of fatalities or work-related injuries involving women, if these women were actually engaged in production-related activities. Of the 187 total documented fatalities over the past five years only 16 (8.6%) were female. There were no documented female fatalities in 2019 and only 1 in 2020. However, there were four female fatalities in 2016, 5 in 2017, and 5 in 2018, each representing an unusually high number of incidents when compared with historical data.

**Incidents Involving Agricultural Confined Spaces**

Since 1978, Purdue University has been documenting agricultural confined space incidents throughout the United States. Over 2,500 cases have been documented and entered into Purdue's Agricultural Confined Spaces Incident Database. For an annual summary of these incidents visit www.agconfinedspaces.org.

Indiana ranks number one historically in the number of documented grain entrapments. In 2019 there was one documented entrapment fatality and one in 2020. It is believed that Indiana's high national ranking for this type of fatality has more to do with the aggressive nature of Purdue's surveillance efforts in the state over the past 40 years rather than the actual number of incidents that occur in other states. There was one documented incident in 2020 involving a successful rescue from a grain entrapment.

Over the past 45 years, 16 manure-related fatalities have been documented on Indiana livestock operations. There have been no cases of this type reported since 2017.

**Farmer Suicides**

In recent years, there has been considerable media attention focused on the issue of farmer suicides. Given the precarious farm economy, especially in the crop and dairy sectors, many farm families are undoubtedly facing severe financial stress. However, no definitive data exist to indicate whether or not Indiana farm operators are at a significantly higher risk of suicide than the general population. The position taken by some media reports that farming is the most stressful of all occupations cannot be substantiated from existing data. A recent CDC study did indicate that workers in the farming, fishing, and forestry industries (as opposed to farm operators) do have an elevated suicide rate. However, this research was withdrawn due to statistical errors. Regardless, it is evident and appropriate that stress and/or behavioral health issues among the rural population are being recognized and addressed during this challenging time.

[11] https://www.nass.usda.gov/Quick_Stats/Ag_Overview/stateOverview.php?state=INDIANA

**INPrepared.org**

Two of the most significant contributors to the reduction in the frequency of Indiana's farm-related fatalities has been the increased capabilities of rural emergency first responders and rapid access to high quality emergency medical services. Injuries that were not survivable 20 or 30 years ago are being successfully addressed by better trained first responders and rapid deployment of air transport medical services.

To further enhance the capacity of Indiana's farm and rural families to respond to typical emergencies, PUASHP has develop and promoted the INPrepared.org website. This tool is designed to enable users to be better prepared to respond to and recover from potentially harmful events.

**Conclusion**

Farm safety and health are not, nor will they ever be, topics that will make the front page of the paper, turn the heads of legislators, or generate an outpouring of public support. However, the no fewer than 1,525 Indiana farm families who have experienced the loss of a family member since 1970, including the 25 in 2020, know personally that the effects of these events last a lifetime.

If you are interested in learning more or supporting the work of Purdue's Agricultural Safety and Health Program, please feel free to call 765-494-1191 or visit www.farmsafety.org.

Other online resources that may be helpful include:

- www.agrability.org
- www.agconfinedspaces.org
- www.youtube.com/USagCenters
- www.eXtension.org
- www.necasag.org
- www.inprepared.org