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Purdue University

Agricultural Safety and Health Program

2014 Indiana Farm Fatality Summary

Compiled by the Purdue University Agricultural Safety and Health Program

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The 2014 Indiana Farm Fatality summary was compiled by Purdue's Agricultural Safety and Health Program through a variety of sources, including a contracted news clipping service, web searches, voluntary reporting from Extension educators and individuals, and personal interviews. No cases were identified from sources outside of the state, including Federal government sources such as the Census for Fatal Occupational Injuries. Findings were compared with findings by the Indiana Department of Labor and adjusted to reflect differences due to data interpretation.[1] There is no claim made that the presented data are comprehensive but rather represent the best assessment currently available.[2]

Summary

A total of 25 farm-related fatalities were documented in Indiana during 2014. The total reflects an increase from the 2013 total of 18, and an increase from the current annual average of approximately 18. The lowest number ever documented in the last 45 years was 8 in 2006. The increase in 2014 represents significant jump in the downward trend that has occurred over the last two decades. The data also show a continued decline in the frequency of farm-related fatalities involving children and youth under the age of 21, which historically accounted for a disproportionate share of total farm deaths. Two documented victims under the age of 21 died as the result of a fall from a skid steer loader bucket and backhoe overturn.

There are slight differences in reporting of fatalities between Purdue and the Indiana Department of Labor due to differences in how workers and events are classified. For example, the Purdue summary has traditionally not included most motor vehicle crashes or heart attacks while working as farm-related, but records them separately. Children involved in farm work have also been historically included in the Purdue report, where as they may not be in the Department of Labor summary. 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 Indiana Department of Labor documented 27 fatalities in 2014 and classified agriculture as the most hazardous industry. [3]

Tractors and farm machinery remained as the most frequently identified agents of fatal injuries during 2014, as they have been for the last 40 plus years. Of special note is that approximately 40% of all documented fatalities in 2014 involved an overturned tractor.

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[1] Appreciation is extended to Mr. Joseph Black, BLS Coordinator, Quality Metrics & Statistics, and Indiana Department of Labor for contributing to this report.

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

[3] 2014 Indiana Census of Fatal Occupational Injuries – Preliminary Release and Analysis.

Even with the increase in fatalities in 2014, there continues to be a slight downward trend in the annual frequency since 1970. Contributing factors to this trend include the decline in the number of Indiana residents who live and work on farms, advancements in the safety, durability, and productivity of agricultural equipment, reduced dependency on child and youth labor, increasing expectations for safer and healthier workplaces and continued efforts to enhance the level of awareness of the importance of managing risks in agriculture to reduce the economic impact of deaths, injuries, property losses, and failure to comply with applicable regulations. Advancements in medical science and emergency medical services, such as improved access to medical air transport in rural areas of the state, have also made major contributions towards reducing the fatality rates by increasing the probability of surviving injuries once considered to be most likely fatal. Achieving zero incidents may be an unrealistic goal, but the record clearly shows that something is working and that many tragic incidents have been prevented during the same time as Indiana farmers have become more productive and efficient than at any time in history.

It should be noted that several other Midwestern states are reporting higher numbers of farm fatalities and many states no longer even have the capacity to document and report on these incidents beyond the limited data from the Census of Fatal Occupational Injuries that has historically underreported farm-related fatalities. Some key agricultural states have done away with 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.

For over 70 years, Purdue University and organizations such as FFA, 4-H, Indiana Rural Safety and Health Council and Farm Bureau have been committed to developing and conducting evidence-based agricultural safety and health programs designed to reduce the risks to producers, their families and employees. Even with all this effort, the problem has yet to be completely solved as evidenced by the tragic losses that occurred in 2014. The data presented in this report are intended to be used to help develop more effective injury prevention strategies.

Findings

A brief description, date, and location 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 dying at medical facilities in neighboring states, and victims dying after the injury event due to related medical complications.[4]

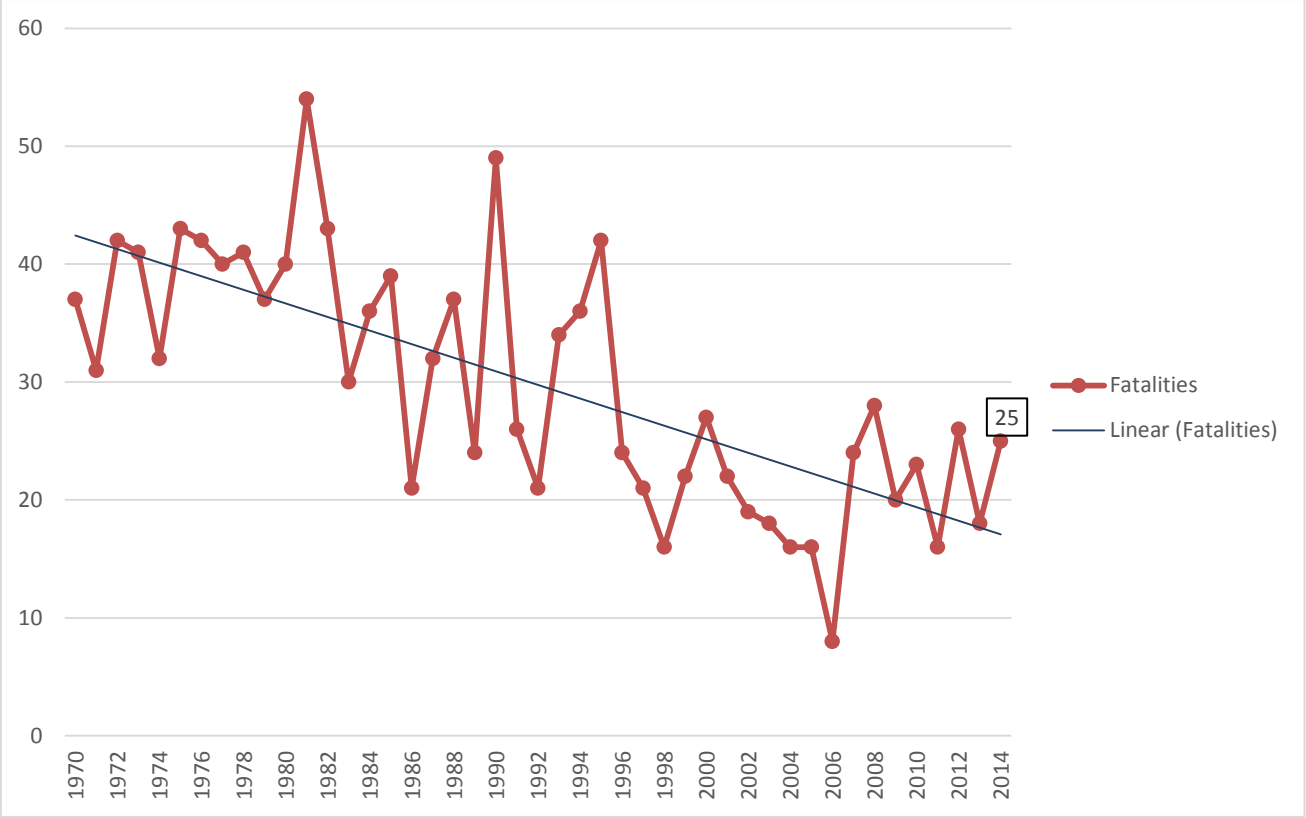
Figure 1 provides a historical look at the frequency of documented fatalities since 1970. As noted, the frequency of these events has been rather erratic over the years, but there has been an overall decline in the number of incidents. It should be noted that during early years the likelihood of incidents not being documented was higher making the decline even more notable. Again, it should be noted that the list does not include fatalities due to motor vehicle crashes involving farm trucks, heart attacks occurring during work activities and medical complications from workplace health hazards.

[4] If you know of additional incidents not included in the data presented and wish to share information on these incidents, please contact the authors.

Table 1. Description of 2014 Farm-Related Fatalities

Date	County	Age	Sex	Description
2/8/2014	Harrison	71	M	Tractor overturned
3/9/2014	Dubois	50	M	Tractor overturned
4/5/2014	Posey	36	M	Tractor hood fell on victim
4/8/2014	Greene	62	M	Drown into pound
4/17/2014	Dubois	81	M	Tractor overturned
5/3/2014	LaGrange	7	M	Fell from skid loader bucket
5/6/2014	Knox	67	M	Collision between train and tractor
5/13/2014	Allen	26	M	Mower overturned
5/19/2014	LaGrange	71	M	Struck by farm wagon
5/31/2014	Boone	90	M	Burned while burning brush
6/22/2014	Adams	88	M	Mower deck collapsed on victim
6/23/2014	Putnam	17	M	Backhoe overturned
6/30/2014	St. Joseph	87	M	Ran over by baler
8/21/2014	DeKalb	39	M	Tractor overturned
9/5/2014	Jay	39	M	Farming incident (?)
9/18/2014	Rush	56	M	Tractor overturned
9/23/2014	Putnam	75	M	Tractor overturned
10/18/2014	Spencer	60	M	Tractor overturned
10/21/2014	Orange	81	M	Head injury while working with live stock
10/25/2014	Posey	82	M	Tractor overturned
10/30/2014	Parke	74	M	Struck by falling tree
11/3/2014	Porter	85	M	Asphyxiation caused by smoke inhalation
11/20/2014	Benton	80	M	Burned in a barn fire
11/21/2014	Bartholomew	66	M	Struck by falling tree
12/13/2014	Gibson	69	M	Grain entrapment

Figure 1. Annual Summary of Farm-Related Fatalities: 1970-2014



No specific factor(s) has been identified that has contributed to the reoccurring spikes in frequency. Other than the incidents involving tractors and farm machinery, other agents of injury have varied widely. This lack of consistency makes the targeting of limited prevention resources difficult, With the exception of tractor-related incidents where a greater focus on Rollover Protective Structures (ROPS) could prove be beneficial.

The age of the victims ranged from 7 to 90 and averaged 62.4, which is slightly higher than the average age of Indiana farmers, currently at 58. As noted in the past, farmers over the age of 60 account for a disproportionate number of farm-related injuries.

The overall decline in the number of children and young adults being reported as dying in agricultural work places is an extremely positive trend. 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 declining trend in fatalities involving this group. The introduction of larger, more complex and expensive equipment has also made many producers less comfortable using young or inexperienced workers to operate it.

Table 2 summarizes documented incidents during the period 1994 to 2014 with respect to youth and those over 60. During that time there were no fewer than 467 fatalities of which 54 were under the age of 18 and 226 were over the age of 60. Again, these two groups have historically represented a disproportional share of the total deaths, accounting for nearly 60% of the total. In 2014, these two age groups accounted for 76% 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
2014	**2**	**8%**	**17**	**38%**	**19**	**76%**	**62.4**	**25**
2013	1	6%	10	56%	11	61%	61.4	18
2012	2	8%	9	35%	11	42%	51.3	26
2011	0	0%	8	50%	8	50%	53.5	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
2007	4	17%	10	42%	14	58%	50	24
2006	1	13%	3	38%	4	50%	49	8
2005	2	13%	5	31%	7	44%	52	16
2004	2	13%	9	56%	11	69%	54	16
2003	2	11%	8	44%	10	56%	55	18
2002	2	11%	9	47%	11	58%	53	19
2001	1	5%	11	50%	12	55%	56	22
2000	5	19%	16	59%	21	78%	55	27
1999	2	9%	6	27%	8	36%	49	22
1998	0	6%	11	69%	11	75%	66	16
1997	3	14%	18	86%	21	100%	46	21
1996	2	8%	13	54%	15	63%	59	24
1995	9	21%	12	29%	21	50%	43	42
1994	4	11%	19	53%	23	64%	52	36
Total/ Average	**54**	**12%**	**226**	**48%**	**280**	**60%**	**53.17**	**467**

Table 3 summaries over 20 years of tractor-related fatality data. During these years, tractors accounted for 218 or 46% of the total of all Indiana fatalities. The most frequent incident continues to be tractor upsets or overturns followed by falling from the tractor and being run over.

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
2014	**13**	**25**	**52%**
2013	6	18	33%
2012	12	26	46%
2011	6	16	38%
2010	11	23	48%
2009	11	20	55%
2008	12	28	43%
2007	7	24	29%
2006	2	8	25%
2005	6	16	38%
2004	10	16	63%
2003	10	18	56%
2002	10	19	53%
2001	13	22	59%
2000	16	27	59%
1999	8	22	37%
1998	12	16	75%
1997	8	21	38%
1996	11	24	46%
1995	19	42	45%
1994	15	36	42%
1994-2014	218	467	46%

With approximately 59,000 productive farms in Indiana with sales of over $1,000, it was estimated for 2014 that one out of every 2,360 farms experienced a farm-related fatality.[5] Using a population of 143,000 operators and hired workers on farms in Indiana, the death rate was approximately 17.5 per 100,000 farm workers.[6] 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 number of work-related fatalities in Indiana (Indiana Department of Labor, 2013).

[5] Estimated number of farms from the final report of the 2012 U.S. Census of Agriculture.
[6] Estimated farm population of operators and hired workers on farms from the final report of the 2012 U.S. Census of Agriculture. This number does not include unpaid family labor.

The estimated fatality rate of 17.5 per 100,000 Indiana farm workers in 2014 compares to an estimated national death rate of 3.5 per 100,000 for workers in all industries and 25.4 per 100,000 for those engaged in agricultural production nationwide.[7]

It is believed, however, that the Indiana and national agricultural fatality rates would be lower if unpaid family laborers were included in the population of those exposed to farm hazards on a regular basis. Furthermore, the National Safety Council data and the Census of Fatal Occupational Injuries have not historically included children under 16 in their calculation of rates, while Purdue's Agricultural Safety and Health Program does if the children were involved with or exposed to farm-work activities.

Figure 2 shows the distribution of all farm-related fatalities over the past 34 years when the county of location was known. It can be noted that no county has escaped a fatality and some counties have experienced an unusually high number. Counties with the highest number of documented cases are as follows:

- Elkhart – 28
- LaGrange – 28
- Greene – 23
- Dubois – 19
- St. Joseph – 17
- Adams – 16
- Franklin – 16
- Harrison – 15

Elkhart and LaGrange counties are home to the state's largest old order/Amish population that have historically accounted for a disproportionate share of farm-related fatalities.

[7] Estimated death rates from the U.S. Bureau of Labor Statistics.

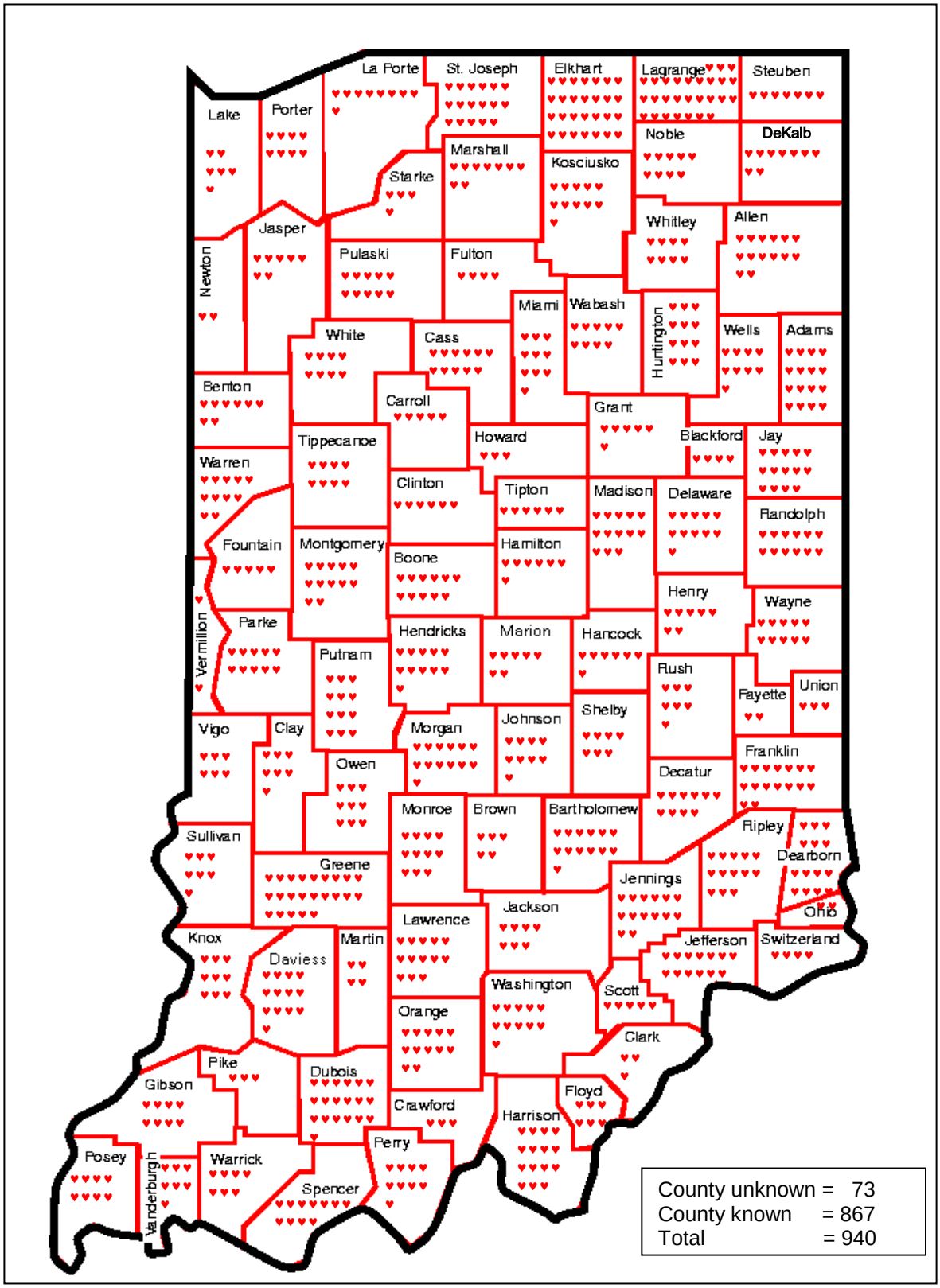


Figure 2. Geographic Distribution By County of Indiana's Farm-Related Fatalities From 1980 Through 2014

Summary of Fatal Motor Vehicle Incidents Involving Agricultural Equipment

Table 4 provides a description of documented incidents involving collisions between motor vehicles and agricultural equipment, including farm trucks. These incidents resulted in four fatalities. There was one incident involving a farm tractor that resulted in three injuries. It should be noted that this type of incident is under reported or access to incident reports is difficult to achieve. Actual numbers are believed to be much higher.

Table 4. Description of 2014 Farm-Related Motor Vehicle Incidents

Date	County	Age	Sex	Description
5/19/2014	Madison	19	M	Collision with milk tanker
5/19/2014	Madison	39	M	Collision with milk tanker
5/30/2014	Miami	Unknown	Unknown	Collision with tractor hauled anhydrous ammonia tanks
8/8/2014	Shelby	73	M	Collision with farm tractor
8/8/2014	Shelby	32	F	Collision with farm tractor
10/26/2014	Madison	Unknown	M	Semi overturned
12/26/2014	Tipton	Unknown	M	Collision with tractor-trailer (fatal)
12/26/2014	Tipton	Unknown	M	Collision with tractor-trailer (fatal)
12/26/2014	Tipton	Unknown	F	Collision with tractor-trailer (fatal)
12/26/2014	Tipton	Unknown	F	Collision with tractor-trailer (fatal)

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

While the Purdue Agricultural Safety and Health Program's surveillance of farm work-related fatalities attempts to be thorough, farm-related non-fatal injuries are not well documented by any source in the state; therefore, there is little data on the frequency and 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 2014 were severe.

Several of the incidents resulted in amputations, head, and spinal cord injuries and involved the use of medical helicopters for transport to a trauma center. In several cases, victims had to be extricated from entanglements in machinery and grain bins requiring large members of emergency rescue personnel. See Table 5 for additional details on documented incidents.

Table 5. Description of 2013 Documented Farm-Related Non-Fatal Incidents

Date	County	Age	Sex	Description
1/9/2014	Allen	17	M	Grain entrapment
1/9/2014	Allen	21	M	Grain entrapment
3/7/2014	Owen	59	M	Tractor run over
3/8/2014	Wayne	68	M	Grain entrapment
4/30/2014	Montgomery	59	M	Auger entanglement
5/26/2014	Kosciusko	59	M	Struck by mower
8/6/2014	Greene	81	M	Grain entrapment
10/17/2014	Washington	Unknown	M	Tractor operator tree impacted

It is estimated, based upon prior research, approximately one out of every nine farms experiences annually a farm-work-related injury requiring medical attention. Based upon the estimated 59,000 farms in the state, it

can be extrapolated that in 2014 there were approximately 6,500 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 6,500 injuries, approximately 131 such cases occurred in the state in 2014. Many of these incidents, however, are not reported in the media, and there is no requirement to report such incidents, including severe injuries, to any official agency. The need for a more comprehensive trauma registry remains and could be helpful in targeting prevention efforts at high risk activities.

To gain a perspective of the potential economic impact of farm injuries to the state, a very conservative estimated cost of $1,200 for medical treatment per injury[8] would result in nearly $8,000,000 in economic losses, not including the costs of transportation to receive medical services, replacement labor, property damage, emergency services, and long-term rehabilitation services. This estimate, however, would be substantially increased if both the direct and indirect costs associated with the 25 fatalities and the 131 permanent disabilities were included. For example, the estimated cost of medical and rehabilitation care for a person with permanent spinal cord damage now exceeds $1 million. Even though there has been a decline in the number of farm-related injuries, it is believed that the economic impact has been on the rise due to the significant increase in medical and rehabilitation costs. This is especially problematic considering that a disproportionate number of farm families still do not carry or cannot afford sufficient health care insurance, or have very high deductibles. A single serious injury can result in an almost insurmountable financial disaster for an otherwise successful farm family. The impact of the Affordable Health Care Act on farm families remains unclear, but provisions should be benefitting those farm families who currently have limited access to health care insurance.

Another unknown cost to Indiana farmers is associated with chronic musculoskeletal injuries caused by over use of joints. An estimated one third of all farm operators have symptoms of arthritis and are primary candidates for joint replacement. Little attention has been given to reducing the risk of joint damage due to agricultural work practices. (For more information see www.agrability.org).

Farm operators have also became more vulnerable to civil litigation due to incidents that result in economic loss to workers, neighbors or the environment. Recent settlements have, in some cases, exceeded the farm's insurance coverage, placing farm assets at risk.

Another issue that can create 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 can result in both excessive personal debt due to medical costs and long-term loss of income.

The lack of both affordable health care insurance and insurance for lost wages due to injury 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.

The Changing Agricultural Workforce

Over the past 30 years, the agricultural workforce in Indiana has changed dramatically. In 1970, when the Occupational Safety and Health Act (OSH Act) was passed by Congress, the U.S. Census of Agriculture showed there were fewer than 100 farm operations in Indiana that were required to comply with certain workplace safety and health provisions of the Act due to their workforce exceeding 10 non-family member employees or providing seasonal/migrant worker housing. The estimated number of current farm operations that could be interpreted as needing to be in compliance with certain OSHA provisions is approaching 1,000. It is assumed that this number will continue to increase with additional farm consolidation and expansion into non-agricultural production enterprises that are not exempt from OSHA oversight. Many farms have grown slowly and quietly, and their owners may not even realize that they should be in compliance with certain provisions of the Occupational Safety and Health Administration (OSHA) regulations.

[8] Estimated cost per injury based upon research conducted at the University of Illinois.

Another major change has been the rapid growth in the number of Hispanics who are now employed in agricultural production operations on a full-time basis. This trend is especially notable on larger dairy, poultry, and hog operations. Many of these workers have limited English speaking skills and lower literacy levels that make traditional agricultural safety and health resources ineffective. To address the workplace safety and health needs of this workforce, attention must be given to developing new and innovative instructional materials that address the hazards of newer and more complex farm operations. Instructional materials need to be culturally sensitive and delivered in a format that can be interpreted by the target audience.

Based upon the most recent agricultural census data, the increasing number of small farms is another important change occurring in rural communities. These audiences of part-time and hobby 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. A significant contributing factor is the use of older, less safe machinery on these smaller operations, especially older tractors without Rollover Protective Structures (ROPS). It has been determined that one of the best ways to reach this population is through online resources.

The recent claims regarding the increasing numbers of women engaged as owner/operators of Indiana farms cannot be proven by any increase in the number of women dying or being injured as the result of farm work. Historically over 95% of all farm workplace fatalities have been male. Considering that there are an estimated 6,400 principal farm operators identified as female, it could be expected that there would be a larger number of fatalities involving women. Of the 71 documented fatalities over the past three years only one was female. All 25 incidents in 2014 were male.

Farm-related Injuries in the Amish/Old Order Communities

Amish are a part of the Old Order Anabaptist subculture, and Indiana is home to the third largest Amish community in North America. This group is closely associated with agriculture, has a larger than average number of children per household, and their population is doubling approximately every 20-22 years. In 1996, one third of all documented farm-related fatalities in Indiana occurred in Amish communities. Elkhart, LaGrange, Adams, and Allen counties, home to some of the largest Amish communities, are also counties with the highest number of farm-related fatalities over the past 40 years. Elkhart and LaGrange counties tie for first place in the number of fatalities documented.

There are several contributing factors to the higher number of cases being historically reported from these communities. These include the widespread use of horses and horse drawn vehicles on public road ways, more labor intensive farm practices, greater use of children in completing farm work, and the recent acceptance of skid loaders and certain hybrid equipment that is engine powered yet still horse drawn.

Over the past 15 years, Purdue Extension, Indiana Rural Safety and Health Council and other organizations have undertaken an aggressive effort to raise the awareness level within the Amish community of the hazards identified through injury data collection efforts. This has included facilitating numerous family safety days that have attracted several thousand Amish family members, encouraging the use of more effective marking and lighting on Amish buggies and carts used on roadways, distribution of 70,000 copies of a safety brochure for motorist traveling in Amish communities, and distribution of over 30,000 copies of a family-oriented farm safety activity book designed specifically for Amish families. Intervention strategies have been developed and presented which include safety material that is more culturally acceptable and conducting farm safety workshops at the church district level. It is clear that continued efforts related to use of horse drawn vehicles on public roadways are needed.

Grain-Related Entrapments and Engulfments

Since 1978, Purdue has been documenting agricultural confined space incidents throughout the United States. Approximately 1,760 cases have been documented and entered into Purdue's Agricultural Confined Spaces Incident Database. For a summary of these incidents visit www.agconfinedspaces.org.

Indiana ranks number 1 historically in the number of documented grain entrapments. In 2014 there was one documented fatality and four incidents requiring extrication from grain by emergency personnel. It is believed that the high ranking has more to do with the aggressive nature of Purdue's surveillance efforts rather than the actual number of incidents that occur. Regardless, leading the nation in these cases is not the right place to be.

With support from an OSHA Susan Harwood Grant, Purdue has been engaged in the most aggressive public awareness effort it has ever conducted on the grain safety topic. For the past four years there have been as many as three grain safety displays at the Indiana State Fair, over 17,000 copies of a safe grain handling brochure have been distributed, over 70 classes conducted for over 2,400 emergency first responders on grain rescue, over 1,200 young and beginning workers have been trained on the hazards of confined spaces, grain safety exhibits have been on display at farm events across the state, and a new website was developed (www.agconfinedspaces.org). As noted in the 2013 summary the projected record 2014 crop resulted in a higher than typical number of incidents. The tremendous diversity in maturity of the 2015 crop suggests that there will be another high number of incidents in 2014

Impact on Agriculture from Natural Disasters

An ongoing review of reports from across the state indicates that farmers are also regularly affected by a variety of environmental forces including drought, flooding, tornadoes, winter storms, lightning, and high winds. In most cases, the bulk of these losses are absorbed by the farm operation due to a lack of comprehensive insurance coverage, high levels of deductibles, and policy coverage limitations. Though not always preventable, some of these losses can be mitigated through adequate planning and more effective response strategies. Fires from various causes, remains the most frequent type of farm loss documented.

Diminishing Resources

As budgets have tightened and legislators at the state and federal levels have explored ways to reduce expenditures, farm safety efforts have not gone untouched. In Indiana, reduced travel budgets and increased fuel costs for Extension staff have made coordination and participation in local safety initiatives more difficult. Educational material that was once free and readily available is now expensive or largely restricted to on-line access. Most commercially available farm safety videos and DVDs have become so expensive that they are now out of reach to most public schools and groups such as 4-H and FFA. The Indiana Rural Safety and Health Council, the only non-profit group in the state with its sole mission being to promote agricultural safety and health, has a budget of only a few thousand dollars per year to spend on exhibits, displays, and information dissemination.

Farm safety and health is not, nor will it ever be, a topic 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 942 Indiana farm families who experienced the loss of a family member since 1980, including the 25 in 2014, know personally the effect these events can have. In many cases, these effects last a lifetime.

If you are interested in learning more or supporting the work of Purdue's Agricultural Safety and Health Program or the Indiana Rural Safety and Health Council, 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.agsafety4youth.info
- www.eXtension.org
- www.necasag.org