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Purdue University

Agricultural Safety and Health Program

2011 Indiana Farm Fatality Summary

Compiled by the Purdue University Agricultural Safety and Health Program

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The 2011 Indiana Farm Fatality survey 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. Findings were reviewed 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

The16 farm-related facilities[3] documented in 2011 show a decrease from the 20 and 23 cases documented in 2009 and 2010 respectively and represented a continuing downward trend in frequency since 1970. By comparison, the 2011 number was substantially less than the peak number over the past 40 years of 54 documented in 1980 but twice the number documented in 2006 when eight, the lowest number ever documented, occurred. The number of farm-related fatalities represented about 13% of the 122 fatal work injuries documented in Indiana in 2011. Tractors remain the most significant agent of injury and no children or youth under the age of 18 were documented as being killed while engaged in farm work. However, there were several serious injuries documented that involved children, and three Amish youth, ages 7, 10, 12, were killed in motor vehicle crashes while operating buggies or pony carts during non-work activities on public roadways.

The continued decline in the frequency of farm-related fatalities is the result of several influences, including the dramatic decline in the portion of the population required to work the land, the tremendous advancements in the safety, productivity, and efficiency of agricultural technology, the continued efforts to educate farmers, farm families, and agricultural workers concerning significant work-related threats, and advancements in medical science that have increased the probability of survival from even severe levels of trauma, including the use of life-line helicopters. Since several other Midwestern states are reporting 3-5

[1] Appreciation is extended to Mr. Joseph Black, BLS Coordinator, Quality Metrics & Statistics, 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] A farm-related fatality is defined as any fatal injury to a farm or ranch worker (or bystander) occurring in the course of performing an agricultural work-related task, or as a result of exposure to hazards in the agricultural workplace. Motor vehicle incidents not clearly involving agricultural equipment or vehicles are excluded. In addition, the report does not include fatalities that may have occurred due to chronic exposures to hazardous environments or substances, or heart attacks that occurred during work activities.

times more fatalities, it might also be concluded that Indiana's efforts have been effective. Many states have diminished efforts to address the farm injury and fatality problem, including eliminating farm safety Extension education programs at Land Grant Institutions. It should be a reasonable goal to declare that we never want to go back to the "good old days" of agricultural production when 60-100 farmers died due to farm-related injuries, 30 or more farm children died due to work-related injuries, and over 100 farmers lost hands or arms to corn pickers, balers, and PTO shafts each year.

Findings

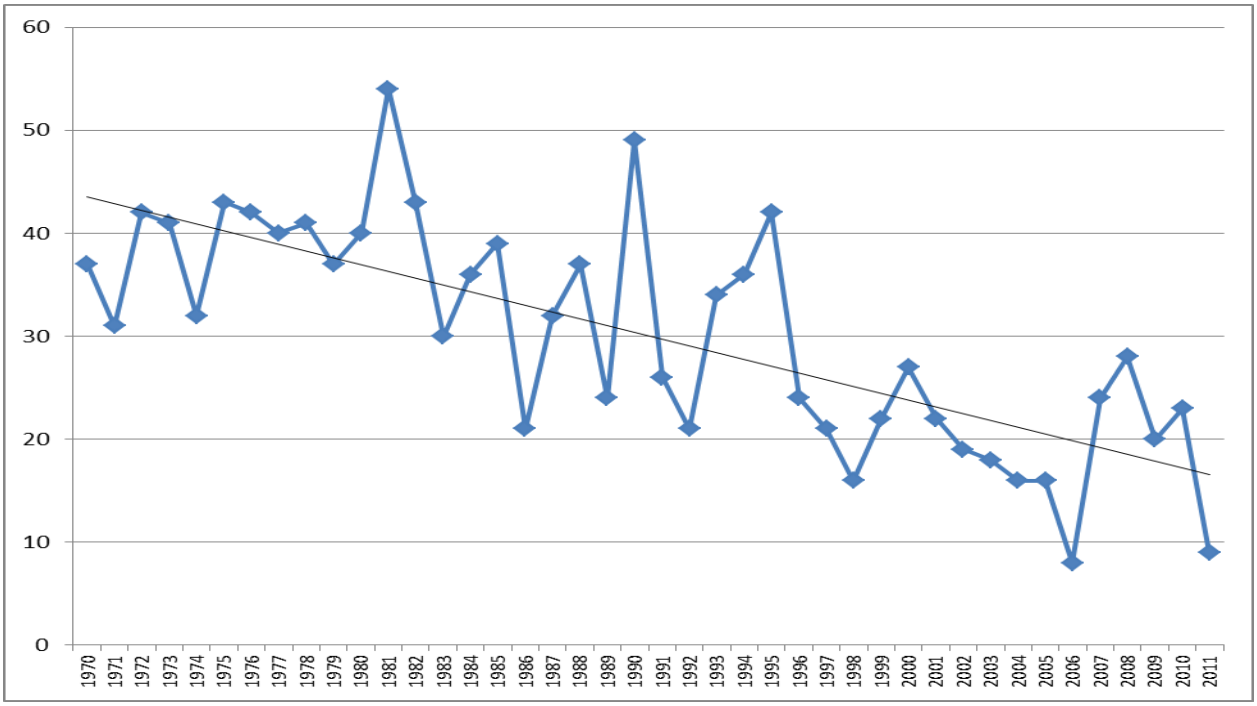
A brief description of each of the 16 farm-work-related fatalities recorded during 2011 is provided in Table 1.

Table 1. Description of 2011 Farm-Related Fatalities

Date	County	Age	Sex	Description
1/8/11	Decatur	63	M	Round bale rolled on top of him
1/18/11	Franklin	46	M	Tree cutting fell on top of him
1/31/11	Ripley	46	M	Highway incident
2/13/11	Allen	30	M	Buggy rollover incident
2/15/11	Wabash	64	M	Truck/highway incident
5/7/11	Boone	80	M	Crushed by tractor
5/9/11	Allen	63	M	Crushed by tractor
6/27/11	Johnson	57	M	Fell off tractor and runover struck by mower
7/1/11	Adams	22	M	Run over by hay wagons
7/22/11	Randolph	24	M	Farm vehicle incident
8/11/11	Jackson	21	M	Crushed by tree
8/22/11	Benton	50	M	Tractor roll over
9/13/11	Vigo	63	M	Struck by log on tractor
11/3/11	Dubois	74	M	Struck by cattle gate
11/16/11	Warren	62	M	Crushed by tractor
12/19/11	Henry	91	M	Highway incident

There has been a wide variation in the frequency of fatalities over the past 40 years as shown in Figure 1. No one specific factor has been identified that contributes to the reoccurring spikes in frequency, but it is clear as shown by the annual trend line that fewer fatalities are occurring. It should be noted that the data have become more comprehensive or complete over the past 10 years as online search capabilities have improved. Also, the data do not include deaths that may have resulted from farm injuries but occurred days or weeks after the incident and the cause of death was identified as something other than the initial injuries.

Figure 1. Annual Summary of Farm-Related Fatalities, 1970-2011



The ages of the recorded victims ranged from 21 to 91 and averaged 53.5. Table 2 provides an age and gender distribution. The average age of the victims is less than the reported average age of 57 for farm operators in the state.

Table 2. Distribution of 2011 Farm Fatalities by Age and Gender

Gender	1-17	18-35	36-59	60+	Unknown	Total	%
Males	0	4	4	8	--	16	100%
Females	0	0	0	0	--	0	--
Total	0	4	4	8	--	16	100%
%	0%	25%	25%	50%	--	100%	100%
Average Age	0	24.2	49.8	70	--	53.5	100%

No females were reported killed in 2011 as the result of a farm-related injury and no child or youth under the age of 18 were reported killed. This is the second time since 1998 that no one under the age of 18 died as the result of a farm-related injury. It is believed that this trend largely reflects the changing roles and expectations for women and children on modern farm operations, increased use of technology that has reduced or eliminated many hazardous tasks, and substantial investments in child safety efforts targeting both farm and non-farm children.

Table 3 shows that during the period of 1994 to 2011, there have been no fewer than 398 Indiana farm-related fatalities documented in the annual Indiana Farm Fatality Summaries, of which 53 and 184 were victims under the age of 18 and over 60 years old, respectively. These two age groups have historically represented a disproportionate share of the total deaths (61%). At opposite ends of the age spectrum, they have also nationally accounted for the largest share of incidents. With respect to youth, this trend has been improving, as noted, but as the average farm operator age continues to increase, the rate of older workers being involved in fatal or serious farm-related incidents will continue to be problematic.

Table 3. Analysis of Youth and "Over 60" Fatalities as Percent of total Farm 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
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	**49**	**12%**	**190**	**48%**	**239**	**60%**	**52**	**398**

Table 4 summarizes the history of tractor-related fatalities since 1994. Over the last 18 years, 193 or 47% of the total Indiana fatalities were related to tractor operation.

Table 4. 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
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%
1994-2011	183	398	47%

With approximately 62,000 productive farms in Indiana with sales of over $1,000, it was estimated for 2011 that one out of every 3,875 farms experienced a farm-related fatality.[4] Using a population of 143,000 operators and hired workers on farms in Indiana, the death rate was approximately 12 per 100,000 farm workers.[5] Indiana is often referred to as an agriculture state, although less than 1% of the workforce is employed in production agriculture. However, the agriculture industry has traditionally been responsible for the highest number of work-related fatalities in Indiana (IN Review Indiana Occupational Safety and Health 2011, Indiana Department of Labor).

The estimated fatality rate of 12.0 per 100,000 Indiana farm workers in 2011 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 from the 2007 report, the latest available data.[6]

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 has 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 31 years where 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 cases are as follows:

- Elkhart – 26
- LaGrange - 26
- Greene - 21
- St. Joseph – 16
- Dubois – 16
- Franklin – 15
- Adams – 15

[4] Estimated number of farms from the final report of the 2007 U.S. Census of Agriculture.
[5] Estimated farm population of operators and hired workers on farms from the final report of the 2002 U.S. Census of Agriculture.
[6] Estimated death rates from the National Safety Council Injury Facts, 2007 edition.

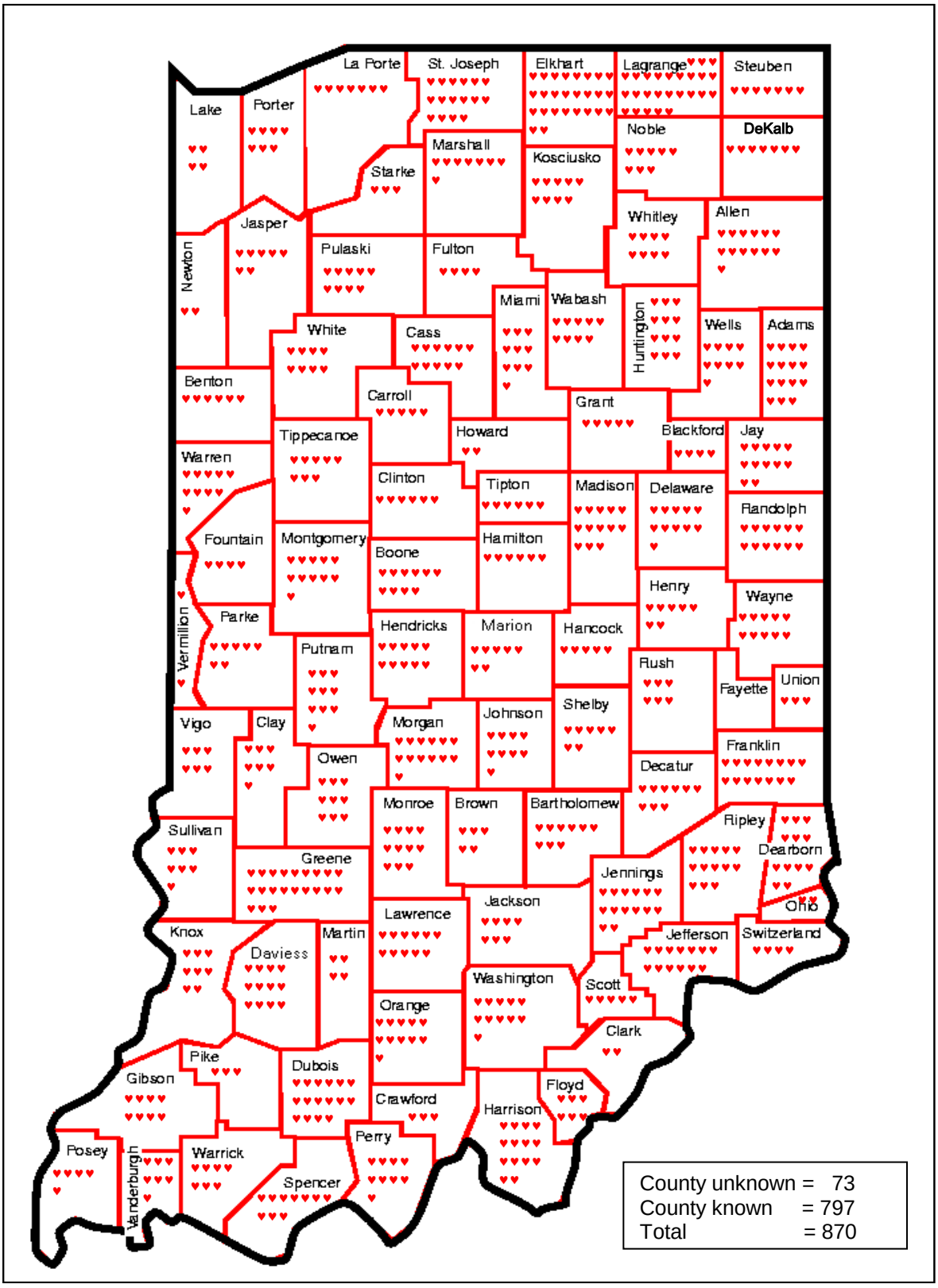


Figure 2. Geographic distribution by county of Indiana's farm-related fatalities from 1980 through 2011.

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 is thorough, but not comprehensive, 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 of injuries that occur annually during farm work. However, the relatively few Indiana non-fatal farm-related injuries that were identified in 2011 were severe. For example, a Wayne County farmer was badly injured when his tractor flipped on top of him. A semi-retired cattle farmer in Johnson County was trapped under his tractor. In June, a 17 year-old girl lost control of her tractor; it rolled down an embankment, caught fire and pinned her underneath, and she suffered serious burns. Another tractor roll-over with injuries occurred in Elkhart County in June. An Elkhart County boy riding on a wagon with hay bales fell off the wagon and his leg was run over by the tractor towing the wagon. In July, a Warsaw woman's mower hit a gas line and caught fire, resulting in extensive burns. A 2 year-old child being carried as an extra rider was injured in a tractor roll-over in Orange County. In White County, a semi hit farm equipment on a highway resulting in injuries to the truck driver. In Greencastle, a tractor-trailer wreck released hazardous agricultural chemicals. In October, a man was working at the top of a silo when the silo's concrete roof collapsed. The victim was buried in silage and received serious injuries. An elderly man in Licking County was run over by a tractor, and received serious injuries. In Allen County, a man was seriously injured when run over by a corn picker. A DeKalb County man was seriously injured when his fully loaded propane tanker hit a cow on the highway. The semi-truck left the roadway, struck a utility pole, and went down into a water-filled ditch with the tanker trailer flipped upside down, pinning the driver inside the cab. See Table 5 for additional details of documented non-fatal incidents.

Table 5. Summary of non-fatal farm-related incidents

Date	County	Age	Gender	Description
3/31/11	Wayne	n/a	M	Older tractor flipped on top of operator, who was flown to hospital, intensive care, treated, released within a week
2/2/11	DeKalb	45	M	Semi-tractor left the roadway, rolled onto its right side, causing the rear door to open and the front right side to separate, allowing dozens of hogs to escape onto the roadway and into adjacent fields
3/27/11	Ripley	n/a	M	Bull escaped, was chased, tranquilized, and returned home without incident
4/5/11	White		M	Cow attacked owner of an excavating business resulting in 6 weeks off from work
5/11/11	Orange	2	M	Tractor roll-over fractured right leg on young boy, DUI charges pending on tractor driver
5/20/11	Johnson	70	M	Farmer trapped under 9000 lb. tractor, firefighters used winch to free him
6/13/11	Elkhart	17	F	Older tractor overturns when operator lost control resulting in serious burns
6/22/11	Lawrence	46	M	Tractor roll-over related injuries
6/28/11	Elkhart	7	M	Child fell off hay wagon and his leg was run over by tractor
6/28/11	Marion	73	M	While a farmer mowed in a wooded area on 300 acres he owns in a rural township, a 20 ft. rotting tree snapped back on him and caused serious chest injuries

7/5/11	LaGrange	1, 4, and 6	n/a	Horse pulling wagon got spooked by a tree trimming crew and took off. Three of the four children – ages 1, 4, and 6 were thrown from the buggy. Children were flown to Ft. Wayne Parkview Hospital. Four-year-old with skull fractures.
7/12/11	Noble	56	M	Tractor roll-over
7/8/11	Warsaw		F	Mower hit natural gas line – burns over 42% of her body
07/20/11	Porter	37	M	Coming into a curve too fast, driver braked. Load of watermelons not properly secured shifted, semi rolled on its passenger side, and 40,000 lbs. of watermelons were spilled, closing two lanes of I-80 ramp for about 6 hours to remove the watermelons
7/23/11	Putnam	54	M	Tractor-trailer wreck caused diesel fuel and another combustible liquid in tank to leak.
7/28/11	Jasper	24	M	Tractor shifted into gear with mowing crew member underneath who was airlifted with internal injuries
8/3/11	White		M	Semi hit farm equipment, farmer suffered minor injuries
8/20/11	Spencer	44	M	Tractor overturned on top of operator while baling, 12 cracked ribs and pneumonia, still in critical care in hospital a month after incident
9/20/11	Lawrence	52	M	Silo's concrete roof collapsed and man buried in silage
9/28/11	DeKalb	52	M	Propane tanker hit cow – man pinned in cab upside down
11/03/11	Huntington	n/a	M	Driver lost control of tractor pulling manure spreader
11/12/11	Allen	25	M	Man run over by corn picker
11/21/11	Blackford	n/a	M	Elderly man run over by tractor

Fires on farms have historically been the most frequently documented incidents and continue to account for substantial economic losses. For example, hay in a Frankton silo caught fire and blew over to the barn, which was destroyed. In March, a barn fire shut down US 35. A farm owner lost a tractor, truck, 4-5 pieces of tillage equipment, a manure spreader and 500 bales of straw in a fire. In Carroll County, a dust collector sparked fire in a grain bin. A woodstove ignited a barn in Tippecanoe County. A heat lamp started a fire that caused minimal damage in a hog barn in March.

It is estimated, based upon prior research, approximately one out of every nine farms experiences a farm-work-related injury requiring medical attention annually. Based upon the estimated 62,000 farms in the state, it can be extrapolated that in 2011 there were approximately 6,888 treated injuries. Prior research by the National Safety Council indicated that 2% of reported farm injuries result in permanent disabilities; applying the 2% estimate to Indiana's estimated 6,888 injuries, approximately 135 such cases occurred in the state in 2011. 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.

To gain a perspective of the potential economic impact of farm injuries to the state, a conservative estimated cost of $1200 for medical treatment per injury[7] would result in over $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 16 fatalities and the 135 permanent

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

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 is 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 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.

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 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. The estimated number of current farm operations that could be interpreted as needing to be in compliance with certain OSHA provisions is 850. It is assumed that this number continues to increase with additional farm consolidation. 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.

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 new 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 change in small farms is another important growth 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. It has been determined that one of the best ways to reach this population is through online resources.

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 is doubling in population approximately every 20-22 years. In 1996, one third of all documented farm-related fatalities 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 30 years. During 2011, no work deaths were reported in Elkhart, or LaGrange; however, there were 5 Amish-related buggy and pony cart-related fatalities with 3 of them documented in Elkhart County.

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 has undertaken an aggressive effort to raise the awareness level within the Amish community of the hazards identified through the injury data collection efforts, including facilitating numerous family safety days that have attracted several thousand Amish family members, encouraging the use of marking and lighting on Amish buggies and carts used on roadways, 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. It is clear that continued efforts related to use of horse drawn vehicles on public roadways are needed.

Impact on Agriculture from Natural Disasters

An ongoing review of reports from across the state indicates that farmers are also regularly effected 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. The tornadoes that passed through southern Indiana in Spring 2011 were especially damaging to many farm operations.

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 870 Indiana farm families who experienced the loss of a family member over the past 30 years, including the 16 in 2011, know personally the effect these events can have. In some 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.grainsafety.us
- www.eXtension.org