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# Purdue University

Agricultural Safety and Health Program

## **2012 Indiana Farm Fatality Summary**

Compiled by the Purdue University Agricultural Safety and Health Program

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The 2012 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. Findings were compared with findings by the Indiana Department of Labor and adjusted to reflect differences due to data interpretation. There is no claim made that the presented data are comprehensive but rather represent the best assessment currently available.

### **Summary**

It was not a very good year for Hoosier farm families and farm workers with respect to the number of farm-related fatalities and injuries that have been documented. The 26 fatalities documented during 2012 was a 63% increase over the 16 cases documented in 2011. This increase represents a dramatic reversal in the downward trend in the frequency of fatalities over the past four years. By comparison, the 2011 total of 16, was the second lowest number ever recorded. The 26 cases in 2012 were, however, only about half the 54 documented in 1980, the peak year over the last four decades, and over three times the 8 documented in 2006, the lowest number during the past 40 years.

The Indiana Department of Labor reported 15 workplace deaths under the broad category of "Agriculture, Forestry, and Fishing". The Department of Labor uses a narrower definition of what constitutes a farm workplace fatality. Their data also shows that 16.8% of Indiana occupational fatalities between 2003-2010 occurred in the agriculture sector and a substantial portion occurred on farms with 10 or fewer employees. The number of farm-related fatalities, regardless of the definition used, continues to represent a disproportionate share of the state's workplace fatalities.

<sup>&</sup>lt;sup>1</sup> Appreciation is extended to Mr. Joseph Black, BLS Coordinator, Quality Metrics & Statistics, and Indiana Department of Labor for contributing to this report.

<sup>&</sup>lt;sup>2</sup> Differences may be found in reporting of prior years due to the addition of previously unidentified cases to the database.

<sup>&</sup>lt;sup>3</sup> There have been, historically, differences between the number of farm-related fatalities reported by the Indiana Department of Labor and the Purdue summary. This is due to the different interpretations being used to define a work-related fatality. Using the Bureau of Labor Statistics' Census of Fatal Occupational Injuries, 15 fatalities were identified in occupations related to agriculture, forestry, and fishing in 2012. For additional information on the Department of Labor summary see Preliminary Data Analysis of the Calendar Year: 2012 at www.in.gov.

Tractors remained the most frequently identified agent of injury during 2012. Two children ages 2 and 9 were killed during farm-related activities. The average age of the victims was 51.3. Nine, or over one-third were over the age of 60. Six of the cases involved trees or tree limbs, a larger than typical number in this category. Not reported under the work-related classification were four Amish youth, ages 7 months, 3, 5, and 17 who were killed in motor vehicle crashes while operating or riding in a buggy or pony cart on a public highway. In addition, five other non-farmers were killed in collisions of motor vehicles and farm machinery on public roadways.

Even with the unexpected spike in the number of fatalities in 2012, there continues to be an overall decline in the frequency of these events. Contributing factors include the continuing decline in the portion of the population engaged in agricultural production activities, advancements in the safety, productivity, efficiency and durability of agricultural technology, continued efforts to enhance the level of awareness of farm-related hazards, advances in medical science and emergency medical services that have increased the probability of surviving severe trauma, and increasing expectations of farm families and farm workers for safer and healthier workplaces.

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. 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, state OSHAs have generally maintained a hands off approach to most agricultural production sites.

For nearly 70 years, Purdue University has 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 solved as evidenced by the tragic losses that occurred in 2012.

#### **Findings**

A brief description, date, and location of the 26 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 event due to related medical complications.

Date	County	Age	Sex	Description	
1/10/12	Noble	55	M	Fell from tractor and run over by mower	
1/18/12	Hamilton	47	M	Overturned ATV in drainage ditch	
2/23/12	Steuben	35	M	Crushed under equipment	
2/26/12	Kosciusko	42	F	Run over by skid steer loader while loading large bales	
3/15/12	Bartholonew	71	M Struck in head by limb		
3/26/12	Elkhart	9	M	Suffocated in pile of cornmeal	
4/28/12	Hancock	23	M Tractor rollover into pond		
5/22/12	Warren	69	M	Fell from equipment	
5/30/12	Montgomery	69	M	Fell from grain bin	
6/8/12	Pulaski	53	M	Struck a tree while operating a tractor	

Table 1. Description of 2012 Farm-Related Fatalities

6/9/12	Parke	60	M	Head trauma caused by tractor rollover
6/22/12	Fayette	58	M	Fell from ladder
6/26/12	Lawrence	66	M	Unknown
6/27/12	Benton	36	M	Crushed under loader bucket
7/25/12	DeKalb	56	M	Fell from the bucket of cherry picker
7/30/12	Daviess	56	M	Fell from a grain bin
8/6/12	Clark	48	M	Struck by limb
8/19/12	Lake	59	M	Fell from tractor and run over
8/19/12	Decatur	76	M	Tractor fell on him
9/21/12	Fayette	57	M	Mower overturned in pond
10/27/12	Jay	79	M	Unknown
11/10/12	Dearborn	62	M	Struck by bucket of tractor
11/25/12	Greene	2	M	Fell from horse at farm
11/27/12	Parke	59	M	Struck by limb
12/16/12	Starke	69	M	Struck by limb
12/28/12	Grant	18	M	Trampled by bull

Figure 1 provides a historical look at the frequency of documented fatalities since 1970. As can be noted the frequency is rather erratic, but there is overall a declining trend in the number of incidents. The average over the past five years has been 22.6 incidents per year.

Figure 1. Annual Summary of Farm-Related Fatalities: 1970-2012

No specific factor has been identified that has contributed to the reoccurring spikes in the frequency of fatalities. Other than the historical high frequency of tractor-related incidents, other causes of death have varied widely. For example, during some years there are more livestock incidents or falls while in other years there are few or none. In 2012, incidents involving trees or being struck by a tree limb were higher than normal along with incidents involving skid steer loaders and loader tractors.

The ages of the victims ranged from 2 to 79 and averaged 51.3 which is substantially lower than the average age of Indiana farmers, currently at 55. Two were documented in the age group of 1-17 as shown in Table 2. It was unusual to see no fatalities in the age range of 10 to 17 which has historically been an age group at high risk of injury. Since 1970 there have only been two years during which no child or youth under the age of 18 was documented as being killed while doing farm work or exposed to a farm workplace.

Gender 1-17 18-35 36-59 **60**+ **Total** % Unknown Males 2 3 11 9 25 96.15% Females 0 0 1 0 1 3.85% Total 2 3 12 9 26 100% % 7.7% 11.5% 46.2% 100% 100% 34.6% 5.5 25.3 51.2 69 51.3 Average Age 100%

Table 2. Distribution of 2012 Farm -Related Fatalities by Age and Gender

The declining frequency of children and youth being reported as dying in agricultural work places is an extremely positive trend. It is believed that this trend reflects the changing roles and parental expectations for children on farms. The introduction of larger more complex agricultural machinery has not only reduced the need for child labor, but has made many tasks too complex for most children and youth to perform.

Table 3 summarizes documented incidents during the period 1994 to 2012 with respect to youth and those over 60. During that time there were no fewer than 424 fatalities of which 57 were under the age of 18 and 199 were over the age of 60. These two groups have historically represented a disproportional share of the total deaths.

Table 3. 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
2012	2	7%	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
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

<sup>&</sup>lt;sup>4</sup> During the past decade Purdue has conducted an extensive effort to reach 10-17 year old youth regarding the hazards of farm work. This has included the development of the "Gearing Up for Safety" curriculum and website providing opportunities for independent learning. For more information see <a href="https://www.agsafety4youth.info">www.agsafety4youth.info</a>.

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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	51	12%	199	47%	250	59%	52	424

**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
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%
1994-2012	199	424	47%

Table 4 summaries 20 years of tractor-related fatality data. During these years, tractors accounted for 199 or 47% of the total of all Indiana fatalities. The most frequent incident continues to be tractor upsets or rollovers followed by falling from the tractor and being run over.

With approximately 62,000 productive farms in Indiana with sales of over \$1,000, it was estimated for 2012 that one out of every 2,385 farms experienced a farm-related fatality. Using a population of 143,000 operators and hired workers on farms in Indiana, the death rate was approximately 18 per 100,000 farm workers. 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, 2012).

The estimated fatality rate of 18 per 100,000 Indiana farm workers in 2012 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.<sup>7</sup>

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 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 cases are as follows:

- Elkhart 27
- LaGrange 26
- Greene 22
- St. Joseph 16
- Dubois 16
- Franklin 15
- Adams 15

<sup>&</sup>lt;sup>5</sup> Estimated number of farms from the final report of the 2007 U.S. Census of Agriculture.

<sup>&</sup>lt;sup>6</sup> Estimated farm population of operators and hired workers on farms from the final report of the 2007 U.S. Census of Agriculture.

<sup>&</sup>lt;sup>7</sup> Estimated death rates from the National Safety Council Injury Facts, 2011 edition.

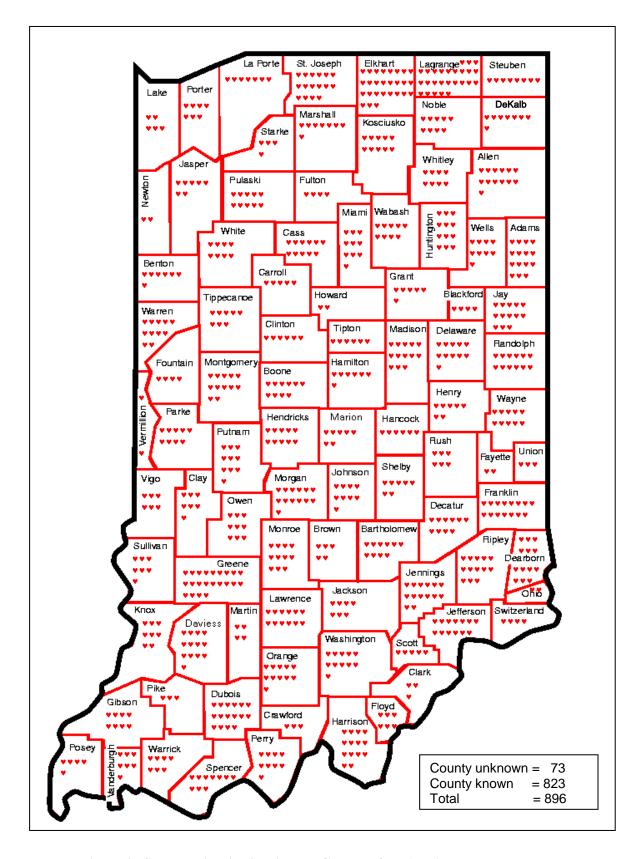


Figure 2. Geographic Distribution By County of Indiana's Farm-Related Fatalities From 1980 Through 2012

#### **Summary of Fatal Motor Vehicle Incidents Involving Agricultural Equipment**

Table 5 provides a description of nine fatalities involving collisions between motor vehicles and agricultural equipment, including Amish buggies and pony carts. In two incidents six individuals were killed including three youth in an Amish buggy and three family members who's vehicle collided with a combine at a rural intersection.

**Table 5. Description of 2012 Farm-Related Motor Vehicle Fatal Incidents** 

Date	County	Age	Sex	Description
2/4/12	Porter	50	M	Highway collision with horse trailer
4/17/12	Adams	5	M	Collision between a buggy and a van
4/17/12	Adams	3	M	Collision between a buggy and a van
4/17/12	Adams	17	M	Collision between a buggy and a van
4/19/12	Fountain	16	M	Highway collision with tractor
7/9/12	LaGrange	7/mo	M	Buggy crash
10/31/12	Tippecanoe	62	M	Collision with combine at intersection
11/1/12	Tippecanoe	40	F	Collision with combine at intersection
11/2/12	Tippecanoe	15	F	Collision with combine at intersection

#### 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 non-fatal injuries that occur annually during farm work. However, the relatively few Indiana non-fatal farm-related injuries that were identified in 2012 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. See Table 6 for additional details.

Table 6. Description of Documented 2012 Farm-Related Non-Fatal Incidents

Date	County	Age	Gender	Description
1/12/12	Wells	Unkn	M	Tractor rollover after highway collision
3/22/12	Elkhart	61	M	Fell from ladder, pinned to ground for six days
4/3/12	Grant	6	F	Finger amputation by horse bite
5/9/12	Madison	93	M	Tractor rollover
5/22/12	Cass	71	M	Tractor overturned
5/30/12	Jasper	33	M	Collision between train and tractor
6/30/12	Jasper	Unkn	M	Collision between train and tractor
8/1/12	Putnam	60	M	Tractor overturned
9/10/12	Wayne	7	M	Backed over by mower
9/17/12	Morgan	63	M	Leg impaled by ATV overturn
11/1/12	Fayette	28	M	Leg amputated by PTO
12/1/12	Wells	Unkn	M	Tractor rollover after highway collision

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 2012 there were approximately 6,888 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 6,888 injuries, approximately 135 such cases occurred in the state in 2012. 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 conservative estimated cost of \$1,200 for medical treatment per injury<sup>8</sup> 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 26 fatalities and the 135 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 may benefit those farm families who currently have limited access to health care insurance.

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. 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

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<sup>&</sup>lt;sup>8</sup> Estimated cost per injury based upon research conducted at the University of Illinois.

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. 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 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.

#### 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 40 years. During 2012, only one work death was reported in Elkhart county involving an Amish youth, however, there were 4 Amish-related buggy and pony cart-related fatalities with 3 of them documented in Adams county and one in LaGrange count.

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. This has included facilitating numerous family safety days that have attracted several thousand Amish family members, encouraging the use more effective of marking and lighting on Amish buggies and carts used on roadways, distribution of nearly 70,000 copies of a 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. 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 1,500 cases have been documented and entered into Purdue's Agricultural Confined Spaces Incident Database. For a summary of these incidents visit <a href="www.grainsafety.us">www.grainsafety.us</a>.

Indiana ranks number 1 historically in the number of documented grain entrapments and led the nation in 2012 with 6 documented cases. 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.

Purdue has been engaged in the most aggressive public awareness effort it has ever conducted on the grain safety topic. For the past three years there have been three grain safety displays at the Indiana State Fair, over 15,000 copies of a safe grain handling brochure have been distributed, over 60 classes conducted for

emergency first responders on grain rescue, and grain safety exhibits have been on display at farm events across the state. With a potential record 2013 grain crop on the horizon, everyone in the grain industry will need to become partners in addressing this problem.

#### **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.

#### **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 896 Indiana farm families who experienced the loss of a family member since 1980, including the 26 in 2012, 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 <a href="https://www.farmsafety.org">www.farmsafety.org</a>.

Other online resources that may be helpful include:

- www.farmsafety.org
- www.agrability.org
- www.grainsafety.us
- www.agsafety4youth.info
- www.eXtension.org