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Purdue University
Agricultural Safety and Health Program

2006 Indiana Farm Fatality Summary

Compiled by the Purdue University Agricultural Safety and Health Program

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Time to Celebrate – Just a Little!

Maybe the idea of celebrating is a bit pre-mature, but during 2006 Purdue documented the lowest number of farm-related fatalities ever recorded. This may be the lowest number ever documented since Indiana became a state in 1816. This accomplishment is not the result of any one influence, but rather is the result of a combination of factors, 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. Since several other Midwestern states are reporting 3-5 times more fatalities than Indiana, it might also be concluded that we are doing something right. Is it a reasonable goal to declare that we never want to go back to the "good old days" of agricultural production when 60, 70, even 100 farmers a year died due to farm-related injuries, 30 or more farm children died annually and over 100 farmers lost hands or arms to corn pickers, balers and PTO shafts each year? Let's hope so!

The 2006 Indiana farm fatality report 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 the Federal government. Neither were any cases identified using official death certificates due to the lack of access to these records at the Indiana Department of Health.

The report includes a summary of eight farm work-related fatalities[1] that occurred in 2006 the least number of fatalities recorded since Purdue began keeping records in the 1940s. For over 30 years there

has been a steady downward trend in the number of farm work-related fatalities. The average age for farm work-related fatality victims in 2006 was 49.4 (Table 1) while the average age over the past ten years was 53.9. All but three documented cases involved males. One (12.5%) of the fatalities involved a 3 year old child who was the only identified fatality involving a child or adolescent under the age of 18, and that was the same percentage as the previous two years.

Tractor related incidents in Table 2 accounted for two (25%) of the recorded fatalities; but when the two roadway fatalities involving a farm tractor and trailer are included, the total fatalities involving a tractor were four or 50%, and that percentage is near the historical average. Roadway collisions, including the double fatality involving a farm tractor and trailer, were the other leading type of fatal farm-related incident in the state accounting for four (50%) of all identified fatalities. A tractor overturn accounted for one (12.5%) of the fatalities, and overturns continue to be the leading cause of farm work-related fatalities nationally accounting for approximately 25% of all fatalities.

	Age Distribution						
Gender	**1-17**	**18-35**	**36-59**	**60+**	**Unkown**	**Total**	**%**
Males	**0**	**0**	**3**	**2**	**-**	**5**	**62.5**
Females	**1**	**0**	**1**	**1**	**-**	**3**	**37.5**
Total	**1**	**0**	**4**	**3**	**-**	**8**	**100**
%	**12.5**	**0**	**50**	**37.5**	**-**	**100**	**-**
Average Age	**3**	**-**	**44**	**72**	**-**	**49.4**	**-**

Table 1. Age distribution of Indiana farm work-related fatalities in 2006.

Table 2 summarizes the specific types of incidents associated with Indiana's farm fatalities in 2006. One type of fatality, falls, that has been historically common to Indiana agriculture was not documented during the year. It is important to note that one of the roadway collisions with two fatalities involved a farm tractor and trailer, and this incident is listed separately from the tractor or machinery-related incidents category. Figure 1 displays a distribution of farm-related fatalities by general types of incidents.

[1] A **farm work-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.

Type of Incident		Fatalities
Entrapments, suffocations, or asphyxiation	Grain entrapments	-
	Drownings	-
	Buried in trench	-
	Gas asphyxiation (manure pit)	-
Livestock-related incidents	Trampled by livestock	1
	Kicked by horse	-
	Horse-drawn wagon incidents	1
Machinery-related incidents	Entanglements	-
	Crushings/pinnings	-
	Runovers	-
Tractor-related incidents	Overturns	1
	Runovers	1
	Crushings/pinnings	-
Roadway collisions	While on tractor	-
	Migrant worker van	2
	With tractor	-
	With pull-behind machinery	2
	With agricultural truck	-
	With livestock	-
Other incidents		-
Total		**8**

Table 2. 2006 Indiana farm work-related fatalities by specific type of incidents.

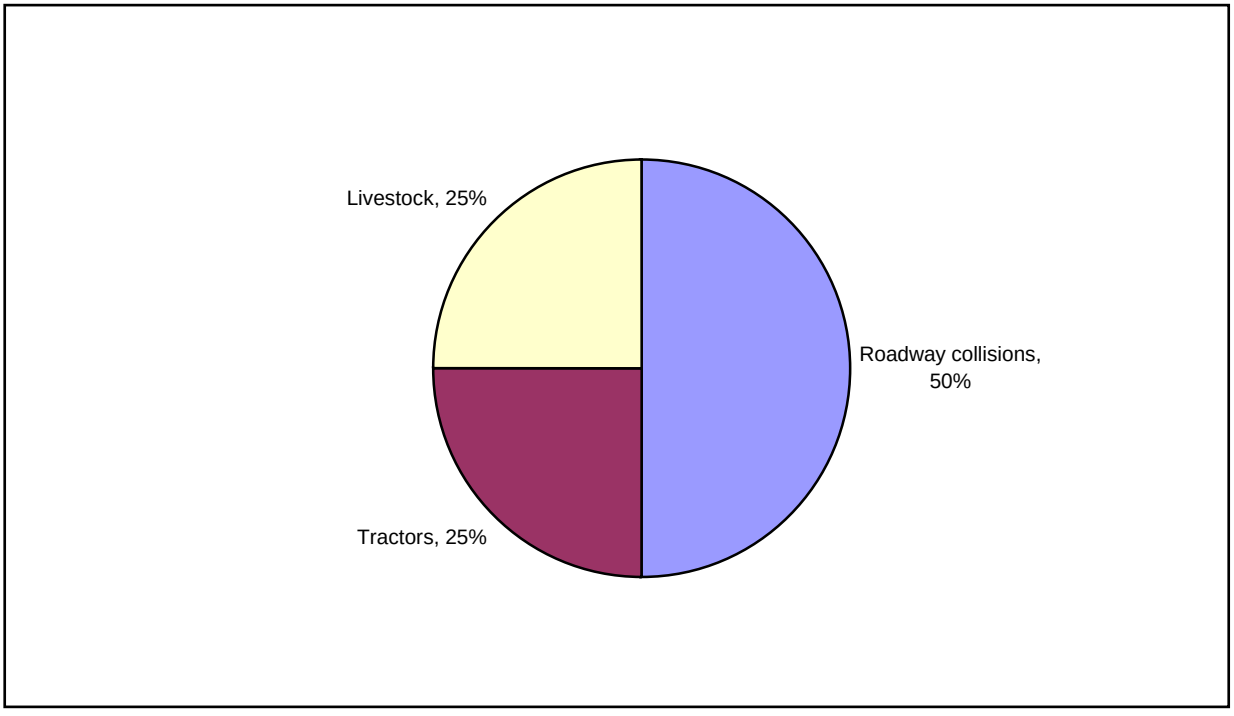

Figure 1. Distribution of 2006 Indiana farm work-related fatalities by general type of incidents.

Table 3 provides a more detailed listing of fatalities that occurred in Indiana counties in 2006. Fatal farm work-related incidents are described here by (1) date of incident, (2) county of incident, (3) age of victim, (4) gender of victim, (5) description of circumstances surrounding the incident, and (6) the Farm and Agricultural Injury Classification (FAIC) Code. The FAIC code is used to facilitate consistent and accurate classification of farm and agriculture-related injuries. Additional information on the FAIC code is available from the American Society of Agricultural and Biological Engineers[2] or by contacting Purdue's Extension Safety Specialist.

The FAIC code system:

- parallels, to the extent appropriate, current nationally established methods for classifying and assigning work-related injury cases to an industry;
- provides a systematic scheme for separating farm production work cases from non-farm-production work cases; and
- permits the identification of cases that uniquely reflect the situational exposures predominate to the agricultural industry.

Date	County	Age	Sex	Description of Incident	FAIC[3]
2/7	LaGrange	58	M	Trampled by bull in pen	1
5/16	Adams	43	F	Migrant worker van, collision with semi truck	1
5/16	Adams	36	M	Migrant worker van, collision with semi truck	1
6/26	Elkhart	3	F	Fell off and run over by horse-drawn wagon	6
8/25	Perry	76	M	Tractor overturn while rotary mowing	1
9/6	Lawrence	80	M	Tractor ran over dismounted operator	1
12/17	Henry	39	M	Vehicle collision with farm tractor and trailer	9
12/17	Henry	60	F	Vehicle collision with farm tractor and trailer	9

Table 3. Listing of 2006 Indiana farm work-related fatalities.

[2] ASABE Standard S575.1, 2002. ASABE, 2950 Niles Road, St. Joseph, MI 49085. Tel: 616-429-0300

[3] FAIC-1 Farm production work
FAIC-6 Farm hazard exposure, non-workers: equipment, tools, objects and products
FAIC-9 Farm hazard exposure, roadway collision (victim not a farm worker)

Figure 2 represents a geographic distribution of Indiana's documented farm-related fatalities in 2006. Two counties had two fatalities in 2006 (Adams and Henry), but only LaGrange had fatalities in both 2005 and 2006. Figure 3 represents a geographic distribution of 686 of Indiana's 759 documented farm-related fatalities in the years 1980 through 2006 where the county of residence was known. The counties with 12 or more identified fatalities over the past 27 years are as follows:

Elkhart	22	Allen	12
LaGrange	20	Franklin	12
Dubois	16	Huntington	12
Greene	15	Jefferson	12
Adams	14	Morgan	12
Jennings	13	Randolph	12
St. Joseph	13	Ripley	12

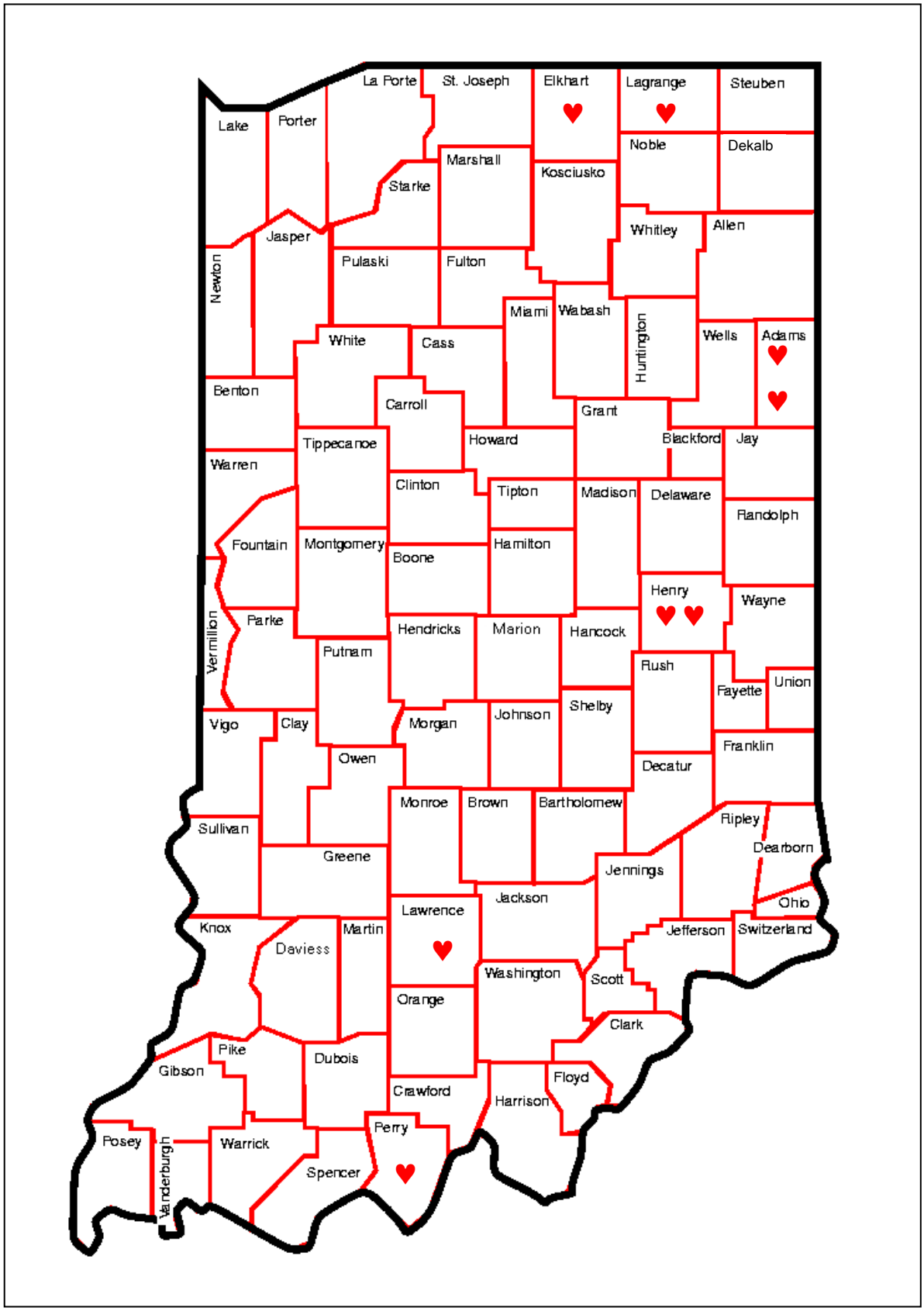

Figure 2. Geographic distribution of 2006 Indiana farm work-related fatalities.

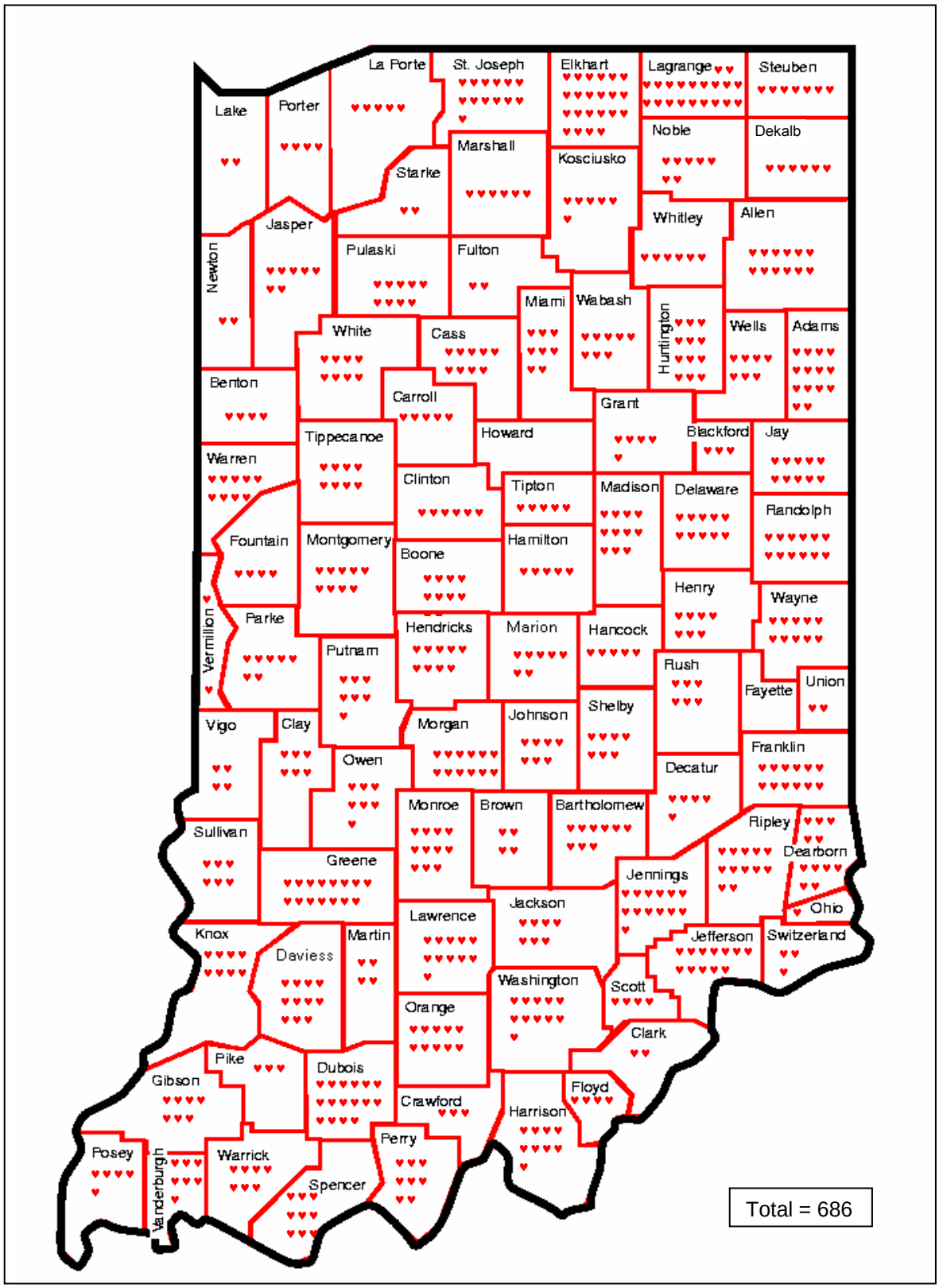

Figure 3. Geographic distribution by County of Indiana's farm work-related fatalities from 1980 through 2006.

Figure 4 displays the general downward trend of identified farm-related fatalities over the past 37 years. The 1998, 2004, and 2005 years each recorded the second lowest number of fatalities (16) while 2006 recorded only eight fatalities, the lowest since Purdue's Agricultural Safety and Health Program has been keeping records. The number of identified fatalities increased in 1999 and 2000 then continued the general decreasing trend from 2001 through 2006.

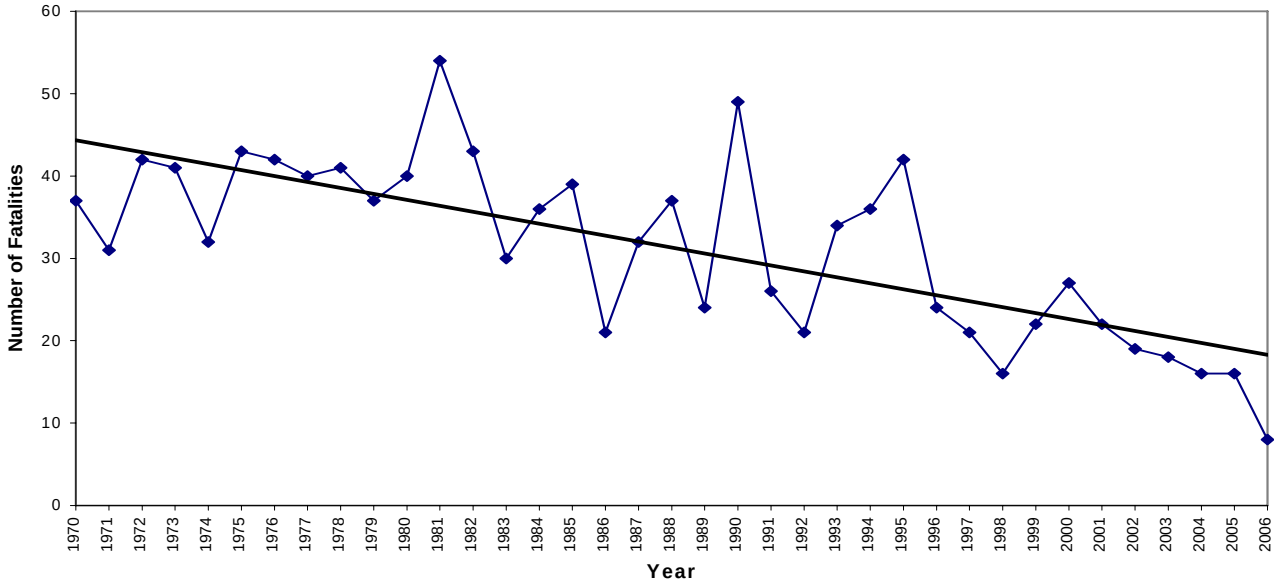

Figure 4. Annual summary of farm work-related fatalities.

Using the number of 60,296 productive farms in Indiana with sales of over $1,000, it was estimated for 2006 that one out of every 7,537 farms experienced a farm-related fatality[3]. Using a population of 143,000 operators and hired workers on farms in Indiana, the death rate was approximately 5.6 per 100,000 farm workers[4]. The rate compares to an estimated national death rate of 3.9 per 100,000 for workers in all industries and 21.3 per 100,000 for those engaged in agricultural production[5]. It is believed, however, that the Indiana and national agricultural rates would be lower if unpaid family labor were included in the population of those exposed to farm hazards on a regular basis. Furthermore, the National Safety Council data does not include 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.

Summary of Indiana's Farm-Related Injuries and Their Economic Impact

[3] **Estimated number of farms** from the final report of the 2002 US Census of Agriculture

[4] E**stimated farm population** of operators and hired workers on farms from the final report of the 2002 US Census of Agriculture

[5] E**stimated death rates** from the National Safety Council Injury Facts, 2002 edition

While the Purdue Agricultural Safety and Health Program's surveillance of farm-related fatalities is rather comprehensive, farm-related 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, many of Indiana's non-fatal farm-related injuries that were identified in 2006 were severe. The incidents reported included: crushing from a round bale rolling back onto the driver of a tractor with loader, auger entanglements, fall from grain bin causing two broken legs, repair materials falling from the top of a grain bin severely injuring a worker on the ground, crushed under falling tree, multiple injuries resulting from several tractor overturns, arm injury in a baler, amputation of arm in auger inlet, arm injury in the gears of an auger, and respiratory distress from the release of anhydrous ammonia by thieves. At least five of the victims had to be airlifted to regional trauma centers. These nonfatal incidents resulted in extremely severe disabling conditions such as paralysis from spinal cord injury, leg amputations and brain trauma. Historically, many of these injuries would have been fatal but were not due to rapid access to emergency medical services. All of the known injury victims were males, and the ages of recorded victims ranged from 20 to 76.

In addition to the four roadway fatalities reported in Table 2, eight nonfatal collisions between vehicles and farm tractors, equipment, and commodities were reported. These included a car crash due to spilled corn on a roadway, a semi tractor trailer that overturned into the ditch while passing a farm tractor, a van collision with a tractor, a car collision with a hay rake and tractor, a loaded farm truck collision with a bicycle rider, a semi tractor trailer collision with a dump truck hauling chicken manure, a car collision with a tractor pulling a sprayer, and the overturn of a semi trailer loaded with hog feed. Another reported roadway collision, though similar to but not farm-work related, involved the fatality of three Amish family members in a collision between a van and their pony cart.

Other reported incidents that did not cause personal injury included: several large manure spills, two barn fires that killed 275 hogs, corn dryer fires, two combine fires, grain bin collapse and another bin partial collapse causing an LP-gas leak.

One fatality was caused by farm animals in Indiana in 2006 when a farmer who entered a pen was trampled to death by a bull. Nationally bull incidents continued to be detected at a frequent rate in 2006 with Web searches resulting in 20 bull cases which included 8 attacks involving fatalities.

It is estimated, based upon prior research, that approximately 1 out of every 9 farms annually experiences a farm-related injury requiring medical attention. Based upon the estimated 60,296 farms in the state, it can be projected that in 2006 there were approximately 6,700 treated injuries. Prior research by the National Safety Council indicated that 2% of reported farm injuries result in permanent disabilities which suggests that approximately 134 such cases occurred in the state in 2006.

To gain a perspective of the potential economic impact of farm injuries to the state, a conservative estimated medical treatment cost of $1200 per injury would result in an economic loss of $8.0 million excluding the costs of transportation to receive medical services, replacement labor, property damage, emergency services, and long-term rehabilitation services. This estimated total, however, would be substantially increased if both the direct and indirect costs associated with the eight fatalities and the 134 perma-

nent disabilities were included. For example, the estimated cost of medical and rehabilitation care for a person experiencing a permanent spinal cord injury now exceeds $1 million.

Even though the total number of fatalities and injuries has been on the decline, it is believed that the economic impact on the state is 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. A single serious injury can result in almost insurmountable financial disaster for an otherwise successful farm family which is further emphasized by the fact that Indiana leads the nation in the rate of bankruptcies filed for medical reasons.

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 programs that nearly all employees of other 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 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 1976, when the Occupational Safety and Health Act (OSHA) was passed by Congress, the US Census of Agriculture showed there were fewer than 100 farm operations in Indiana that were required to comply with the workplace safety and health provisions of the act due to their workforce exceeding 10 non-family member employees. In 2002, the estimated number that could be interpreted as needing to be in compliance has grown to around 850. It is assumed that this number will continue to increase with additional farm consolidation. Many of the farms have grown slowly and quietly, and their owners may not even realize that they should be in compliance with OSHA.

Another major change has been the rapid growth in the number of Hispanics that are now employed in agricultural production operations on a full-time basis. This trend is especially notable on 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 material that addresses the hazards of newer and more complex farm operations. That material needs to be culturally sensitive and delivered in a format that can be interpreted by the target audience.

Farm-related Injuries in the Amish/Old Order Communities

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 largest number of farm-related fatalities over the past 30 years.

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

Over the past 10 years, Purdue Extension has undertaken an aggressive effort to raise the awareness level within the Amish community of the hazards being identified by the injury data collection efforts and has facilitated over 20 family safety days that have attracted several thousand Amish family members. Intervention strategies have been developed and presented which include new safety material that is more culturally acceptable.

Impact on Agriculture from Natural Disasters

An ongoing review of reports from across the state indicates that farmers are also regularly impacted by a variety of environmental forces including 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 adequate 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. A good example is the damage caused by frozen pipes, a significant source of insurance claims. Utilizing appropriate design criteria, recognizing the need to protect vulnerable pipes and providing short-term but safe supplemental heating could save farm families hundreds of thousands of dollars annually that are spent to repair broken pipes and water damage.

Motor Vehicle Safety

The most frequent cause of work-related deaths for Indiana farm families and farm labor are, and always have been, motor vehicle crashes. The total number of deaths may be lower, but the rate is just as high and probably higher than other segments of the population due to the exemption that farm truck operators have from having to comply with the state motor vehicle seatbelt law. It may be that the single most important step that could be taken to reduce work-related fatalities among farmers is to encourage or require them to buckle up every time they get behind the wheel and head out on the highway.

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 and 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 Pur-

due Audio Visual Library, once a major source for borrowing safety-related videos has closed its doors to non-Purdue related organizations. 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. To make matters worse, USDA eliminated all farm safety funds from the budget for the past two years leaving several states with no, or greatly diminished farm safety programs. Due to the foresight of Purdue's earlier Extension directors, Purdue's commitment to farm safety and health had already been incorporated into line item budgets and was not impacted as much as most states.

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, if you belonged to one of the 759 Indiana farm families that experienced the loss of a family member over the past 27 years, including the eight in 2006, you know personally the impact these events can have. In some cases, the effects last a lifetime.

If you are interested in 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.

For additional information, contact 765-494-1191 or visit www.farmsafety.org.