# NORTHEAST AGRICULTURAL FATALITY REPORT

## NORTHEAST CENTER ST

FOR OCCUPATIONAL HEALTH AND SAFETY



**Bassett Healthcare Network** New York Center for Agricultural Medicine and Health

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APRIL 2023

FUNDING FOR THIS STUDY WAS PROVIDED BY THE CENTERS FOR DISEASE CONTROL AND PREVENTION, NATIONAL INSTITUTE FOR Occupational Safety and Health (CDC-NIOSH) Grant No. 20540H007542.

#### INTRODUCTION

Across the Northeast region, there are more than 167,000 farms, producing a wide array of agricultural products (Figure 1, page 11). It takes an enormous amount of labor to produce these agricultural goods, and unlike many other worksites, the farm is also home to many farm families and farmworkers. Safety improvements have made farming today safer than in the past, however, more work needs to be done. Agriculture still remains one of the nation's most dangerous industries. For 2021, the national fatality rate for farmers, ranchers, and other agricultural managers was 17.5 full-time equivalents (FTE) per 100,000 workers. In comparison to the all-worker fatal injury rate of 3.6 FTE, this is almost five times greater than the all-worker fatal injury rate [1]. This vital industry accounts for \$164.7 billion of the national GDP [2] and has steep economic

impacts on the American people.

An agricultural work-related fatality is especially devastating at a local level. For example, research has shown that seven out of ten farms go out of business within five years following a tractor overturn fatality [3]. Those effects ripple far beyond the afflicted farms, communities, and local businesses. Understanding fatality trends can help researchers, safety professionals, and the agricultural community to make the best choices for injury prevention, with the goal of preventing future tragedy.

Based in Cooperstown, NY, the New York Center for Agricultural Medicine and Health (NYCAMH) conducts research, education, and outreach to



make agriculture a safe and productive industry. NYCAMH's footprint extends far beyond New York, through a northeast regional presence known as the Northeast Center for Occupational Health and Safety in Agriculture, Forestry, and Fishing (Northeast Center). In all, our dual organizations cover the vast region from Maine to West Virginia (Figure 2).

#### **INTRODUCTION, CONTINUED**

Together, with the goal of preventing future traumatic injuries, we gather agricultural fatality statistics on a yearly basis from a variety of sources. Our research includes all instances of agricultural-associated fatalities including those of non-workers, such as children who may be bystanders on the farm. This sets these data apart from other entities like the Census of Fatal Occupational Injuries (CFOI), which focuses specifically on the workers within an industry. Fatalities in this report are representative of all those involved in agricultural activities, whether they are farmworkers, bystanders, or victims of public roadway accidents involving agricultural equipment and vehicles.

#### METHODOLOGY

We monitor news coverage of agricultural fatalities in the Northeastern U.S. using an online press clipping service. An information specialist identifies cases through use of keywords and then visually inspects to verify their relevance, after which cases are uploaded to a database. Farm and Agricultural Injury Classifications (FAIC), Occupational Injury and Illness Classifications System (OIICS), and North American Industry Classification System (NAICS) codes are then assigned. Narratives are given particular attention as they often reveal additional detail, and relevant files are attached to cases as necessary.

Records in this report were queried for the year 2022, and cross-referenced with other sources of agricultural injury surveillance such as the AgInjuryNews database [4,5]. Microsoft Excel (Microsoft Corp., Redmond, Washington) was used to conduct initial analysis, and descriptive statistics were developed for age, gender, type of event, source of injury, and other factors. It is worth noting that these numbers may not be exhaustive, as they have yet to account for data gathered by the state CFOI programs, which release their findings at the end of the year following the year in question (i.e. 2022 data will be released at the end of 2023).

#### RESULTS & DISCUSSION

For the Northeast region, 37 agricultural fatalities were identified, with 21 in Pennsylvania, 8 in New York, 2 in West Virginia, and 1 fatality each for Connecticut, Delaware, Maine, Massachusetts, New Jersey, and Vermont. No fatalities were

identified for Maryland, New Hampshire, or Rhode Island. With Pennsylvania and New York collectively representing nearly 80% of such fatalities in the region (Figure 3), results will be presented separately for these two states, in addition to the northeast as a whole.

Agricultural fatalities can happen both on and off the farm, as farmers and farmworkers use public and private roadways to transport agricultural equipment and vehicles between fields, to other farms, and to market. Across the region as a whole, almost one-quarter of all agricultural fatalities occurred in roadways, and nearly one-in-five occurred in a field or pasture. The percentage of fatalities occurring in fields or pastures was higher for New York at two-in-five. However, in Pennsylvania 20% of fatalities occurred



Pennsylvania 20% of fatalities occurred on a roadway, with an additional 20% taking place in grain bins, and another 20% occurring in outdoor areas.

Regarding specific events, 40% of all fatalities involved motorized vehicles of some sort, with the majority of those involving jack-knifed or overturned vehicles. This is aligned with previous research, which demonstrates that the case fatality rate of agricultural truck and auto incidents is nearly five times that of non-agricultural crashes [6]. These trends hold true when breaking the data into individual states, though roadway injuries are particularly present in Pennsylvania's data. Off-road and industrial vehicles were the source for 35% of fatalities across the NEC region, with agricultural machinery making up another 19%. Off-road and industrial vehicle fatalities occurred both on public and non-public roadways. Four fatalities in Pennsylvania were caused by grain bins or silos, with the oxygen deficient environment contributing to the fatalities.

#### RESULTS & DISCUSSION, CONTINUED

Unsurprisingly, the busier months of the agricultural year have more fatalities compared to the rest of the year. Within the NEC region, July and August saw the highest number of fatalities, coinciding with the crop season, with a small spike occurring in May. These three months alone accounted for roughly half of all farm deaths in 2022. Interestingly, there was a larger occurrence of fatalities in New York during March, coinciding with calving season, however this trend did not present in Pennsylvania. The Pennsylvania fatalities departed from the pattern seen in other NEC states, with two-out-of-three fatalities occurring between May and August.



#### Figure 4: Distribution of Fatalities by Age, Pennsylvania

Additionally, half of all male fatalities and all female fatalities occurred during this period.

As agricultural workers are mostly male, it comes as no surprise that the majority of agricultural fatalities occur to men. Of the 37 fatalities recorded in this report, six were women, half of those Pennsylvania residents (Table 2, Page 12). Likewise, with 21 deaths, Pennsylvania had the most agricultural fatalities, with 17 men, three women, and one fatality where the sex was not reported. Two-thirds of deaths occurring to women happened on roadways, and in 84% of those roadway incidents, the women killed were not working. Most were either passengers in agricultural vehicles or occupants in a personal vehicle which collided with agricultural equipment. Nearly three-

quarters of male fatalities were related to farm work.

The age of those killed in agricultural fatalities varied between states, with Pennsylvania being the largest contributor across all ages (Figure 4). In Pennsylvania and New York, the largest contributer to these statistics were working-age adults ages 18-59 (75% and 53%, respectively). In the ten remaining states, only 29% of agricultural fatalities occurred in this age group, however, fatalities among older adults, ages 60-95, were most prevalent in the other states at 57%, compared to 25% in New York and 16% in Pennsylvania. Pennsylvania fatalities skewed in the direction of children and younger agricultural workers, with peaks occurring in ages 0-9, 16-19, 35-44, and 45-54 (Figure 4). Perhaps most concerning, however, is the prevalence of childhood fatalities in Pennsylvania; 32% compared to none in New York and 14% in all other NEC states. These tend to occur in outdoor areas, such as roads and fields, and in conjunction with industrial vehicles and agricultural machinery (Figure 5). It should be noted that these numbers may be skewed due to one roadside accident involving multiple child fatalities.

Pennsylvania has a large Anabaptist population, and it is typical for children to participate in farm work from a young age. Unfortunately, Anabaptist children accounted for all the child fatalities in the state in 2021, mirroring trends from previous years [7]. As young children are not fully equipped to recognize hazards on the farm, they are naturally more susceptible to injury and death. They should be supervised by a competent adult whenever others are engaged in agricultural activities, and especially near high-risk sites such as manure pits, grain bins, and tractors. Ideally, a safe play area would be designated on the farmstead, ensuring children are out of harm's way. Safety education and farm hazard awareness critically mitigate the dangers to young children. The National Children's Center for Agricultural Health and Safety has a wealth of resources on this topic [8].



#### Figure 5: Fatalities by Source, by State



#### RESULTS & DISCUSSION, CONTINUED

While childhood fatalities played a role, most fatal injuries across the NEC region, occurred throughout the prime working years (Figure 6, page 7). Risk exposure is typically the greatest during these years, when workers are frequently around dangerous machinery and livestock, and typically take on the more hazardous activities on the farm.

#### LIMITATIONS

The findings of this report are subject to several limitations. As media reports are the primary source of agricultural fatality aggregation, there is always the possibility that some events are missed. To mitigate this issue, the AgInjuryNews website is reviewed, and the New York State Census of Fatal Occupation Injuries (CFOI) Program is consulted. However, as CFOI designates agricultural fatalities based upon an individual directly carrying out agricultural duties, it is possible that civilian fatalities occurring as a result of agricultural activities, e.g. roadway crashes, are not included. Additionally, the data release timing from other programs may mean some fatality records may not be represented in these data.



#### PREVENTION STRATEGIES

Though agricultural fatalities in the NEC region are generally on the decline, it is important to maintain vigilance especially when dealing with agricultural equipment. Various programs exist to reduce agricultural fatalities. The National ROPS Rebate Program (NRRP), which offers a 70% refund to cover the cost of purchasing and installing a Rollover Protective Structure (ROPS) on a tractor. Farmers in New York and Iowa are eligible, and limited funding may also be available in Pennsylvania, Vermont, New Hampshire, Wisconsin, Massachusetts, and Minnesota [9].

Agricultural operators can increase the visibility of their equipment by ensuring that all lights and flashers on their farm vehicles are functional. Reflective tape increases visibility to motorists at dusk, while flags, flashers, and slow-moving vehicle emblems draw attention to the vehicles, aiding in the avoidance of a collision. If farmers must operate their farm vehicle on the road before dawn or after dusk, ensuring that their headlights are functioning will increase visibility to other motorists, and allow them to avoid hazards. Finally, operators should take additional care when traveling along narrow bridges, gravel, shoulders, or ruts, as their vehicles may not maneuver as well as a passenger vehicle in these conditions. With adherence to safety guidelines, installation of safety systems, and a generalized commitment to the wellbeing of the agricultural community, we may one day see a zero-sum fatality year.

Farms can be wonderful places for kids to grow up, but a little prevention can go a long way to keeping them safe. Safe play areas can be designated to help keep little ones away from hazardous equipment, animals, and other dangers. The Marshfield Clinic research foundation has released a safe-play booklet to guide parents in delineating play areas on their farms [10]. They suggest a physical boundary be established through fencing, gates, or shrubs. Further, they recommend play areas be away from farm equipment, near first aid, hand washing, and toilet facilities, and supervised by a competent adult. The Marshfield Clinic safe-play guide includes a worksheet and step-by-step checklist to help plan out the play area on your farm, and can be found in the references section of this paper [10]. Many children are eager to help on the farm, but parents must remember that their age and maturity help dictate what tasks are appropriate for them. To assist with this, cultivatesafety.org has released various guidelines regarding the supervised cleaning of calf pens, grain bins and service alleys, feeding livestock, and many other farm work activities suitable for youths [11]. To find a full page of guides, go to cultivatesafety.org and navigate to the Work tab.

#### PREVENTION STRATEGIES, CONTINUED

In Pennsylvania specifically, resources can be found through the Penn State Cooperative Extension website. It offers online courses around tractor safety, farming best practices, food sanitation protocols, safe transportation of food, and more. In addition, they have developed apps that can assist in farm hazard analysis and disaster preparation. The Penn State Cooperative provides hundreds of articles, videos, and news articles released monthly which can help educate those interested in the agricultural sector [12].

Within New York, the New York Center for Agricultural Medicine and Health (NYCAMH) offers a variety of safety programs with the well-being of farmers and agricultural workers in mind. Safety training is available for tractors, skid steers, animal handling, chainsaws, chemicals, and pesticides, among many other topics. In addition, personal protective equipment (PPE) and power take off (PTO) shields are available for purchase, while the John May Farm Safety Fund and Rollover Protection System (ROPS) Rebate Program provide an opportunity for farmers to cost share the expense of improving safety on their farms and farm equipment. To take advantage of these services, reach out to NYCAMH via phone at 800-343-7527, or email: info@ nycamh.org.

For all Northeast states, additional resources can be found by connecting with the Northeast Center for Occupational Health and Safety by visiting necenter.org or calling (800) 343-7527. If you are looking for something specific, connect with our agricultural safety and information specialists for a custom query.



#### **FIGURE**



Figure 1: Top Three Commodities by State [13]

#### **TABLES**

USDA Region	State	Number of Farms	Farms as % for NEC Region	Number of Producers*	Hired Workers
Northeast I	СТ	5,521	3%	9,771	12,442
	ME	7,600	5%	13,865	14,293
	MA	7,241	4%	13,371	14,572
	NH	4,123	2%	7,346	5,267
	NY	33,438	20%	58,870	59,433
	RI	1,043	1%	1,868	1,833
	VT	6,808	4%	12,540	8,969
Northeast II	DE	2,302	1%	3,963	4,363
	MD	12,429	7%	21,645	16,701
	NJ	9,883	6%	16,873	27,969
	PA	53,157	32%	91,830	68,388
Appalachian II	WV	23,622	14%	38,409	10,439

Table 1: Agricultural Producers, All NEC Region [14]

State	Female	Male	Unknown			
New York		8				
Pennsylvania	3	17	1			
All Other States	3	5				
Total	6	30	1			
Table 2: Fatalities by Sex and State						

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#### ACKNOWLEDGEMENTS

We owe a debt of gratitude to Deborah Dalton, NYCAMH Information Specialist, for maintaining the fatality database. Additionally, special thanks to the AgInjuryNews research team at the Marshfield Clinic's National Farm Medicine Center.



Bassett Healthcare Network New York Center for Agricultural Medicine and Health





## WHO WE ARE: HISTORY OF THE NORTHEAST CENTER

The Northeast Center is one of 12 Agricultural Safety and Health Centers funded by the National Institute of Occupational Safety and Health (NIOSH), a Centers for Disease Control (CDC) agency that is responsible for developing worker health and safety solutions. Our center addresses the specific occupational health and safety needs of workers in the highrisk agricultural, forestry, and fishing industries from Maine to West Virginia.

Through research, education, program development, and partnerships, we work to understand the safety and health challenges and to identify actionable solutions so these essential workers can thrive and survive on the job.





### MISSION STATEMENT

The mission of the Northeast Center (NEC) is to enhance the health of AFF workers by identifying priority health and safety issues and working with AFF communities and stakeholders to develop prevention solutions.

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