

This presentation is part of an educational modular program designed to provide new and beginning farmers and ranchers with relevant information to initiate, improve and run their agricultural operations



United States Department of Agriculture
National Institute of Food and Agriculture

**This program is funded by the
Beginning Farmer and Rancher
Development Program (BFRDP)**

USDA-NIFA-BFRDP 2010-03143



Farm Safety



This project is partly sponsored by USDA-NIFA-BFRDP 2010-03143.

Farm Safety



Because of the vast amount of material that can be included in this topic, we have only included a general overview of farm safety concerns

For each of these subjects there is much more information available from other resources that will go into more detail

Farm Safety



Because there are many important topics to discuss related to farm safety, we have split this topic into 4 (four) different presentations

Farm Safety 1 = Tractors, equipment, tools, electricity and lifting

Farm Safety 2 = Livestock, chemicals, toxic gases and dust

Farm Safety 3 = Weather and Fire

Farm Safety 4 = Slips/trips/falls, highway traffic, noise, enclosed spaces, manure pits, pond/water, wells

**You can read the presentations in any order that you want
but we strongly recommend that you read them all**

Farm Safety 1

**Tractors
Machinery/equipment
Hand tools
Electricity
Lifting**

Farm Safety 2

**Livestock
Chemicals
Toxic gases
Dust**

Farm Safety 3

**Weather
Fire**

Farm Safety 4

**Slips/trips/falls
Highway traffic
Noise
Enclosed spaces
Manure pits
Pond/water
Wells**

Why is it important to talk about Farm Safety?



We have all heard the stories of the retiree that wants to go into farming because it will be relaxing and easy

The office employee that thinks that farming is stress-free

The family that want to start a farm because they want to spend time outdoors



However farming is not a hobby

- It is very physically demanding and is considered to be one of the most dangerous professions
- It has a very high injury rate
- Fatality rate of 25.1/100,000
- Most injuries can be permanent



List of most dangerous jobs (2009)



1. Fishers and related fishing workers



2. Logging workers



3. Farmers and ranchers



4. Structural iron and steel workers



5. Aircraft pilots and flight engineers



Farming can be more dangerous than:

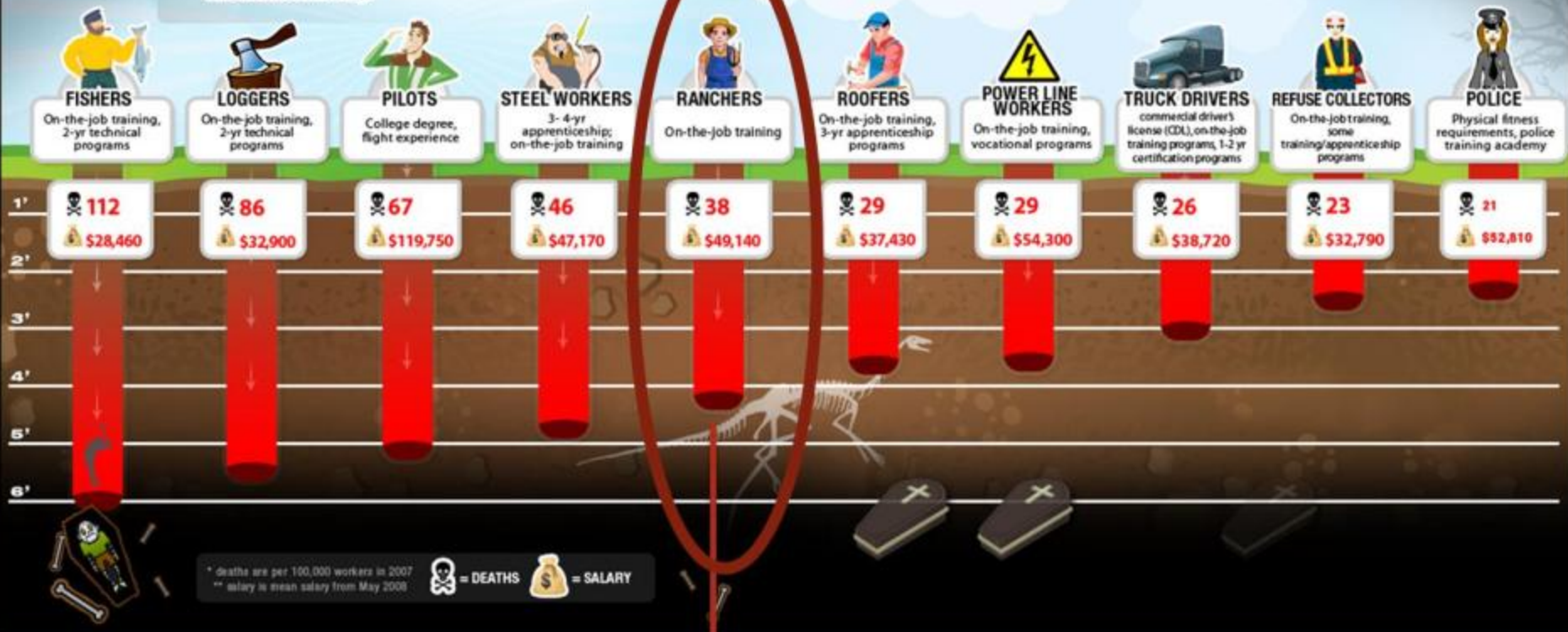


The 10 Deadliest Jobs in the US

2007

EarnMyDegree.com

Here are the 10 most dangerous jobs in America. Each profession is depicted along with educational/training requirements, mortality rate and median salary.



It doesn't make sense that being such an important element in our society and such a dangerous job, that there aren't more training programs and support for new and beginning farmers

Farming is one of the few industries in which the whole family is at risk for fatal and non fatal injuries

<http://www.chaffinfamilyorchards.com/about.php>



<http://www.ediblesadvocatealliance.org/sustainable-learning-journey-blog/>

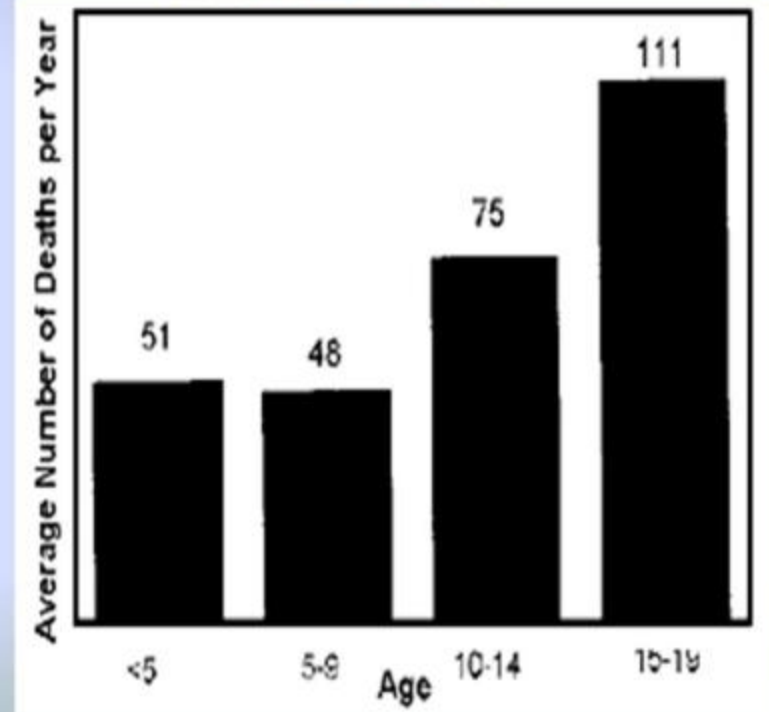
Alphabetical listing of recognized Safety and Physical hazards, Biological and Chemical Hazards and Diseases pertaining to agriculture

| Safety and Physical Agents: | Biological and Chemical Agents: | Agricultural Diseases: |
|--|---|--|
| <p>Commodity storage & transfer</p> <p>Electricity</p> <p>Ergonomics</p> <ul style="list-style-type: none"> Back injury Lifting Repetitive trauma <p>Farm machinery</p> <ul style="list-style-type: none"> Balers Chain saws Combines Power take-off (PTO) Roll-over protection Safety guards Tractors <p>Fire</p> <p>Fuel storage (leaks and fires)</p> <p>Illumination (poor lighting)</p> <p>Lightning (shock and fire)</p> <p>Liquefied Propane [LP] gas</p> <p>Liquefied anhydrous ammonia</p> <p>Livestock handling injuries</p> <p>Physical/environmental hazards</p> <ul style="list-style-type: none"> Noise Thermal (heat and cold) Ultraviolet (sun light) Vibration Psychological stress Sanitation (field) Transportation (on & off road) Welding | <p>Asphyxiation/suffocation</p> <ul style="list-style-type: none"> Confined space Entrapment (see commodity s.&t.) Fumigation Carbon Monoxide (combustion) Silo gases (NO₂ and CO₂) <p>Detergents</p> <p>Diesel exhaust</p> <p>Disinfectants including</p> <ul style="list-style-type: none"> Chlorine Quaternary ammonia compounds Organic iodides Cresol-based compounds Formaldehyde emitters <p>Dusts (inorganic aerosols)</p> <p>Hydrogen sulfide (a key manure gas)</p> <p>Microbiologic organisms</p> <ul style="list-style-type: none"> Infectious microbes Mold spores (mycotoxins) Noninfectious bioaerosols Parasites <p>Nitrogen dioxide (silos & welding)</p> <p>Organic dusts - e.g.</p> <ul style="list-style-type: none"> Cotton dust Endotoxin (on many organic d.) Grain dust Sugar cane (bagassosis) Wood dust <p>Pesticides (including application and harvest activities)</p> | <p>Arthritis</p> <p>Dermatoses - caused by</p> <ul style="list-style-type: none"> Heat Irritant chemicals Infectious microbes Insects Sensitizing chemicals Sunlight <p>Noise Induced Hearing Loss</p> <p>Immunologic diseases</p> <ul style="list-style-type: none"> Allergic rhinitis Asthma Dermatoses <p>Noninfectious diseases</p> <ul style="list-style-type: none"> Cancer (is actually a low risk) Hypertension and heart Respiratory diseases Asthma (also immunologic dis.) Bagassosis (from sugar cane) Bronchitis Byssinosis (from cotton dust) Farmer's Lung (see also HP below) Hypersensitivity pneumonitis Organic dust toxic syndrome (ODTS) Pneumoconiosis (e.g. silicosis) Silo filler's disease (see also NO₂) <p>Organophosphate poisoning and sequelae</p> <p>Silo unloader's disease</p> <p>Zoonotic diseases</p> |

Children safety



- Farm injuries are particularly high among children:
 - Between 100 to 300 youth die on farms annually
 - Children often work on the family farm
 - Children will play on equipment
 - Because children are always present, parents can become complacent





OSHA

<http://www.osha.gov/>



Farm Safety



- Always Call 911 if there is an emergency
- Owner/operators should take at a minimum a first aid course, which includes CPR





Slips Trips Falls

Ladders

According to the American Ladder Institute, ladder accidents claim nearly 300 lives yearly (almost a person a day!)

- Make sure ladder is in good working order prior to using it
- Make sure the ladder can handle the weight you will put on it
(weight of person + tools/equipment)
- If you are using an A-frame ladder make sure that the braces are locked in place



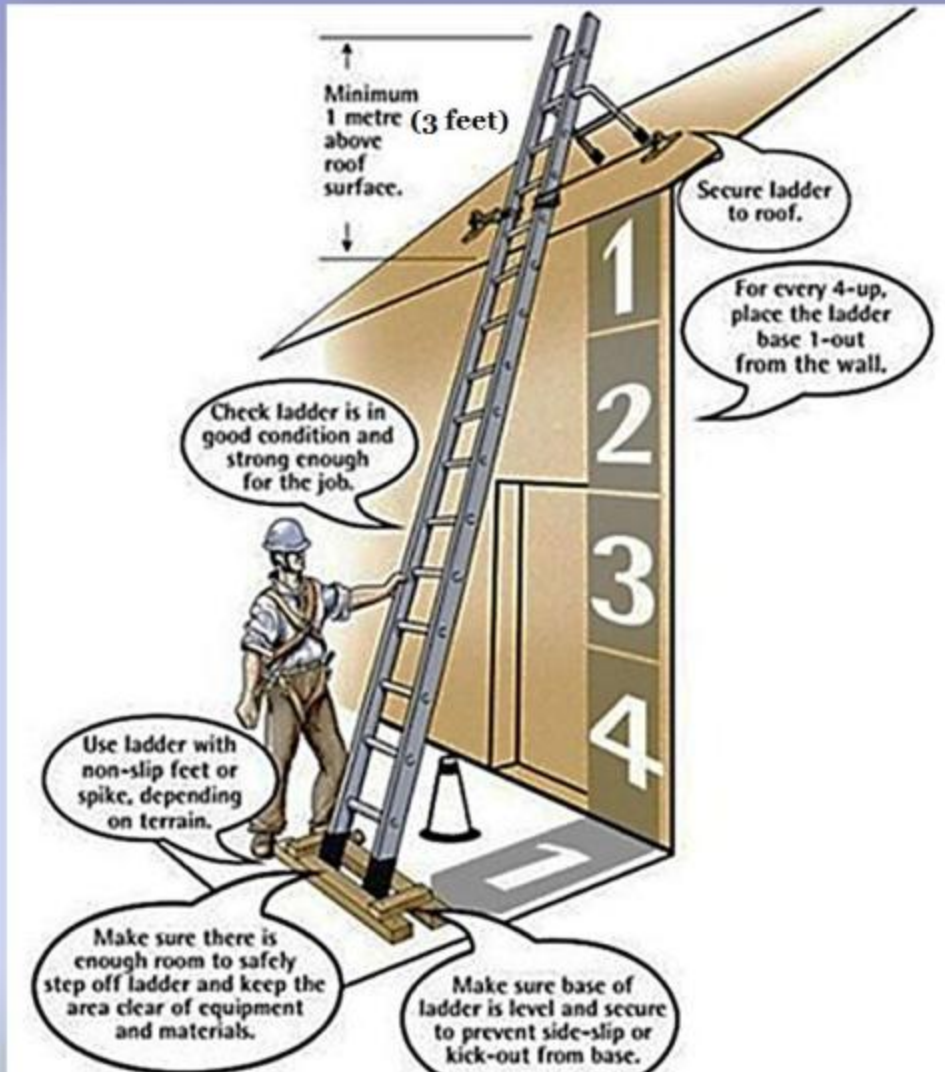
Do not use! Ladders in need of repair must be taken out of service immediately or replaced.

Ladders



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- ◆ Make sure tall ladders are secured to prevent movement before climbing
- ◆ Always face the ladder when using them
- ◆ Keep 3 points of contact as you climb or descend
 - ◆ Move only one hand or foot at a time
 - ◆ Keep both feet on the ladder, don't put one on another surface



Ladders

If using a ladder to climb to another surface, make sure that it extends at least 3 feet beyond that surface



- ◆ Make sure that clothing especially belt buckles do not catch on ladders
- ◆ Don't stand on the top rung or the paint shelf of a stepladder (A-frame)
- ◆ For straight and extension ladders do not climb past the third rung from the top
- ◆ If you have to place a ladder in front of a door way, lock the door to prevent someone entering and knocking the ladder over

Ladders

- Always place the ladder on a flat even surface that is stable

Never place a ladder on top of another object

- If working with electricity remember that aluminum ladders conduct electricity so use a wood or fiberglass ladder
- Watch out for electrical lines when raising, lowering or carrying ladders
- Lastly, ladders are not toys, so keep kids away from them

Never leave them where children can climb them
(they love to play on them)



Slips/Trips/Falls



- Farm work often involves working on or crossing uneven ground
- Other possible hazards include:
 - Holes made by animals (sometimes they fill with water and appear as a puddle)
 - Branches, stumps and rocks
 - Ice
- Crossing creeks and ditches can be hazardous as moss can make rocks and logs slippery

It is better to pass through a gate than to climb over fences





Highway traffic

Highway traffic



A major cause of tractor accidents on public roads is the difference in speed between cars and tractors

Stay as far to the side of the road as you can so that others can pass by

Farm tractors and equipment require hazard-warning lights (flashers) when operating on public roads (amber or white lights on the front and amber or red lights on the rear)

Make sure the lights are working and clear of mud

Highway traffic



When moving farm equipment on a roadway always use a slow moving vehicle sign

Use caution on narrow roads

Farm equipment can stick out past the side of the tractor

Watch for low bridges and branches and narrow lanes

ALWAYS make sure all farm implements or load is securely fastened



Be careful entering the roadway, farm equipment or animals do not accelerate quickly



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Cut back the vegetation
and add a permanent
warning sign around the
farm entrances





Noise

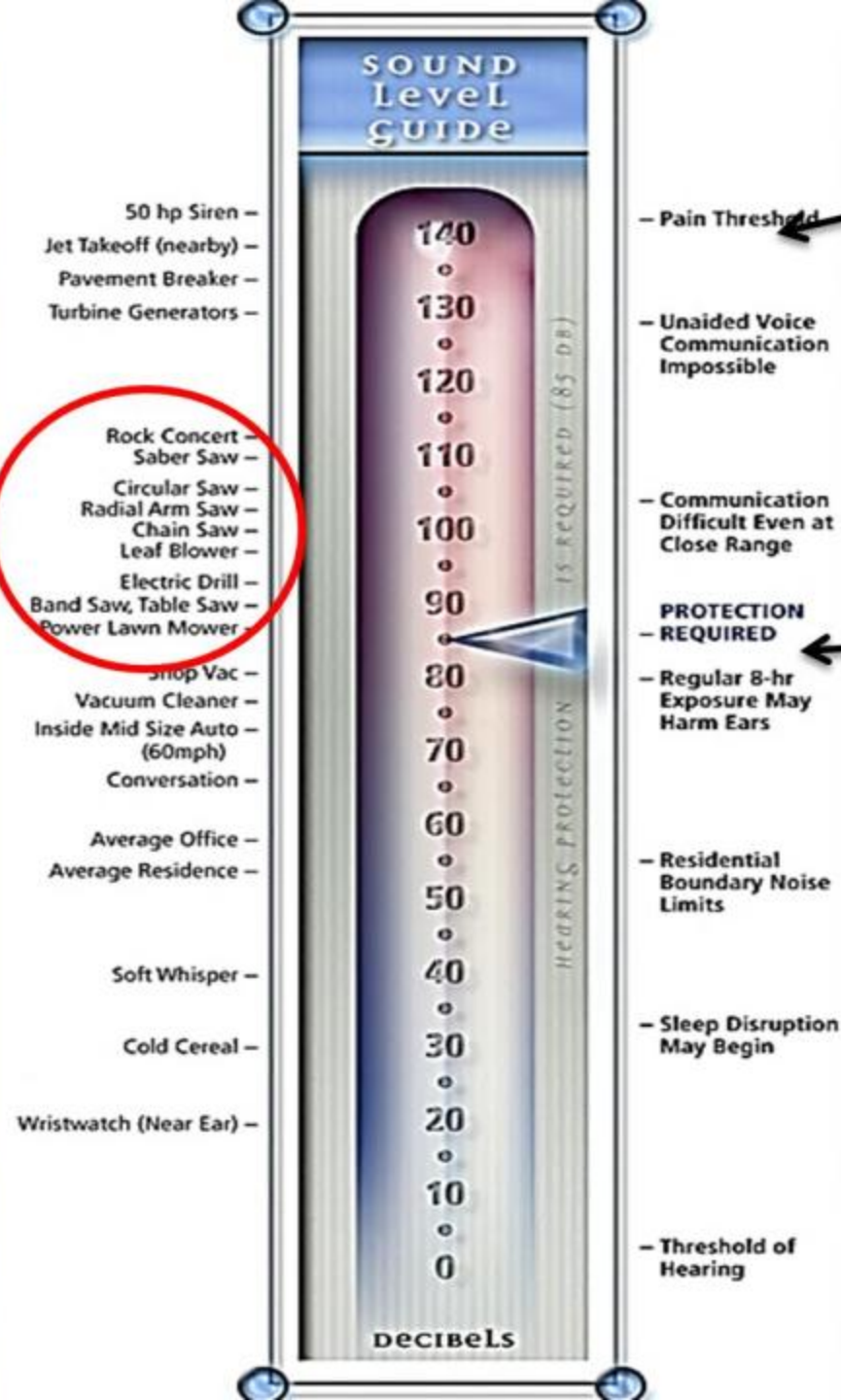
Noise

Exposure to noise can lead to fatigue, headaches and hearing loss

Sources of farm noise include:

- Chainsaws
- Tractors (without cabs)
- Tools (angle grinder, table saw, etc.)
- Heavy machinery or other equipment
- Firearms
- Lawn mowers



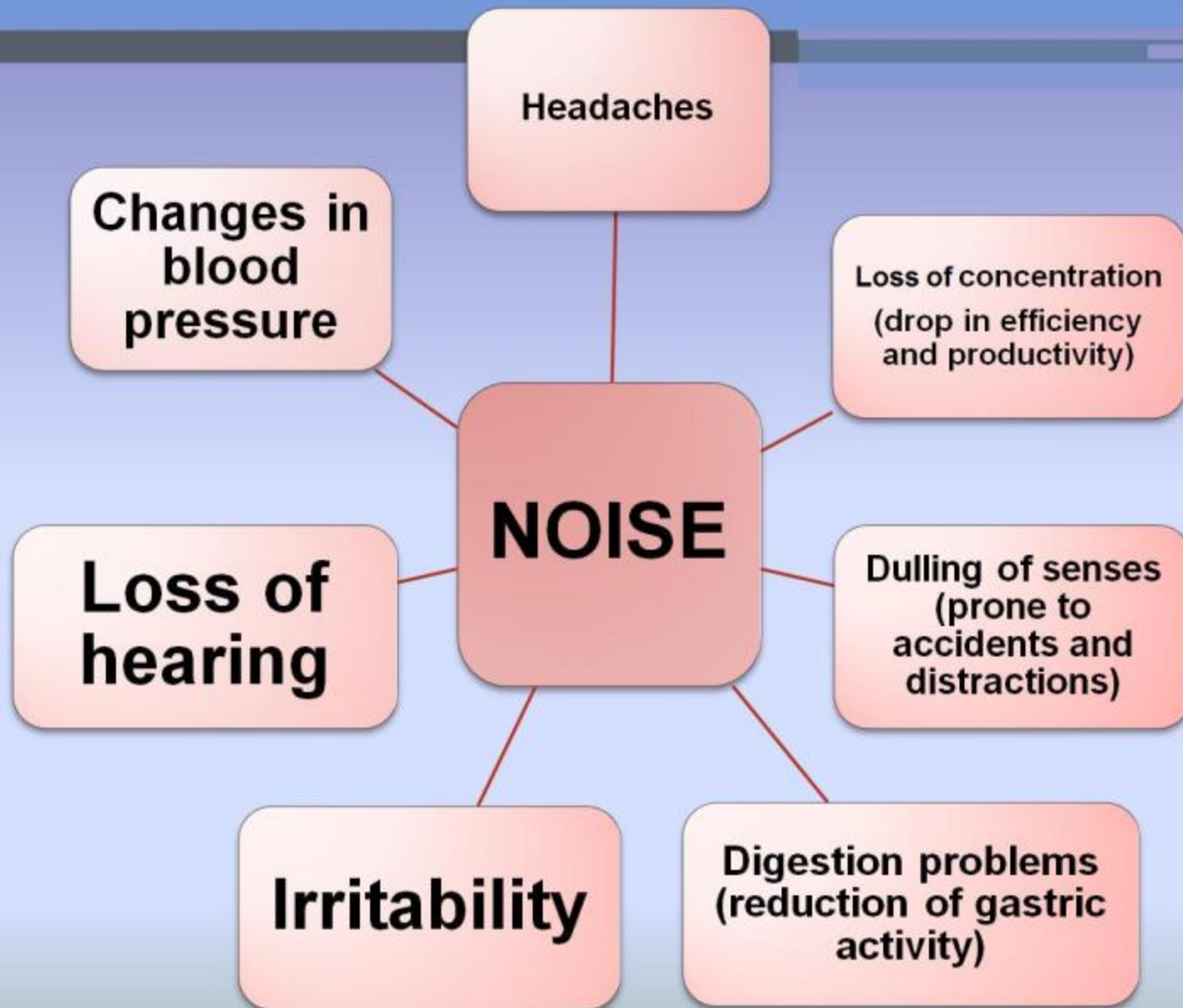


Instant ear damage occurs at about 140 decibels



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Earplugs are recommended for volumes 85 decibels or above



The warning signs of hearing loss include:



- Ringing or buzzing in one or both ears
- Turning up the volume on the radio or TV so that others think it is too loud
- Difficulty understanding children
- Difficulty understanding voices in a crowded room

Noise induced hearing loss is 100% preventable, but once it happens it is permanent and irreversible

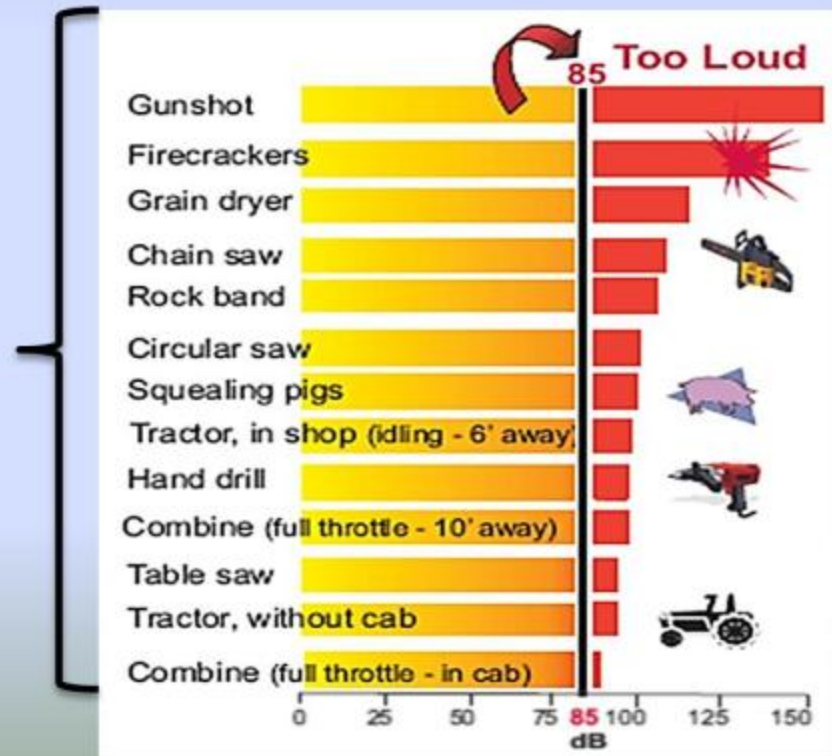


Prevent hearing loss by:



- ◆ Use hearing protection (ear plugs, ear muffs)
- ◆ Use sound barriers to isolate noise
- ◆ Limiting time spent in noisy situations

You need hearing protection for all of these activities!!!
(all over 85 db)



In some working environments
too much protection can be
dangerous



Enclosed spaces

Grain bins and Silos

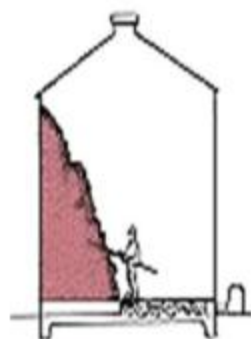
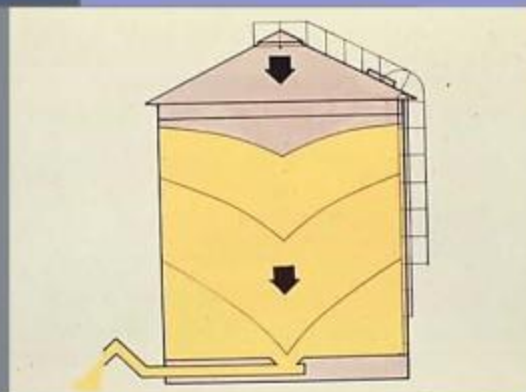


Grain bins/Silos

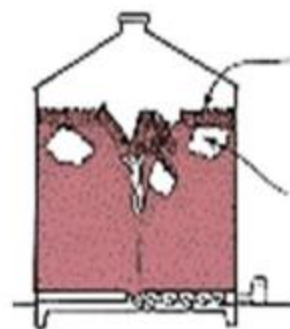
- ◆ Grain bins and silos are used to hold harvested crops
- ◆ They can have a build up of toxic gasses if they are not ventilated correctly
- ◆ The highly corrosive environment of silos makes annual inspections of your systems essential to check for deterioration or physical damage
- ◆ It is always dangerous to enter bins and they should be maintained so that children can not get in them



Grain being stored is removed through an opening in the center of the bin. As you can see, this process pulls the grain down and toward the center of the bin. This will cause a depression and a void in the middle of the grain



Vertically crusted grain can collapse on a farmer attempting to break up the crust



Crusted grain surface can seem even and stable but there can be voids underneath



Grain wagons can be a hazard, particularly to youngsters. The grain in a grain wagon acts just like the grain in a bin when moving. As the grain settles it will create a void and pull the child down, and most children (or adults) are not strong enough to pull themselves out of the moving grain.

Grain bin safety

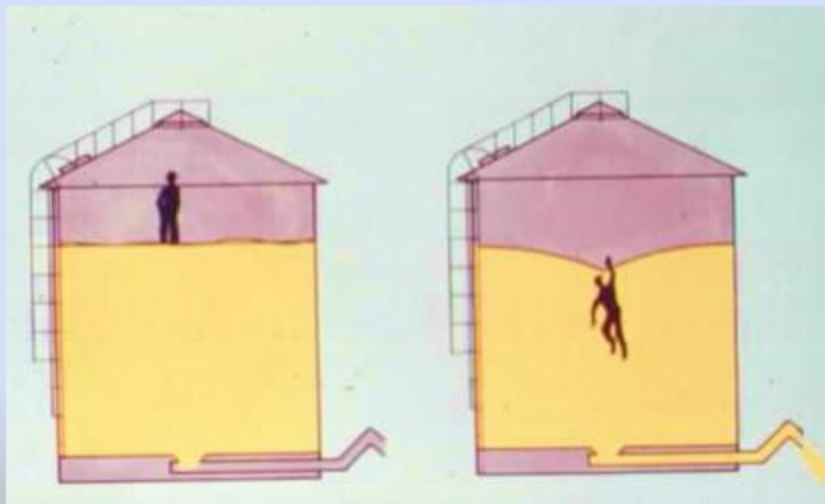


This person has been pulled down into the grain and pulled toward the center of the bin.

Once a person has been pulled into the grain above their knees, they cannot get out of it by themselves. The pressure of the grain on their legs and the grain flowing down will hold a very strong grasp.



A person can get covered with grain in a matter of seconds



Grain bins/Silos

If you must enter a bin then use the following safety tips:

- Make sure all augers are off (lock them off) before going in
- Break up the crust on the surface of the grain with a long pole before entering
- Wear a safety harness attached to a rope and have at least 2 other people there to help. **NEVER GO ALONE!!**
- Stay near the outer edge and keep walking if the grain starts to flow
- If possible install ladders inside the grain bins (painted in bright colors for easy location)
- Wear breathing protection (dust can cause difficulty in breathing)
- **Never attempt to rescue someone by going into the grain yourself**
Call 911



Manure pits

Manure pit



**Manure
pile**



Slurry tank

Many farmers have died after entering manure pits



Inside the pit, the manure undergoes anaerobic digestive fermentation
This process can generate potentially dangerous gases:

- Methane
- Hydrogen sulfide
- Carbon dioxide
- Ammonia

Manure pits should be treated like any other type of confined space. As such:

- All manure pits should be ventilated
 - Some of these gases are heavier than oxygen and tend to stay near the bottom of the manure pit
- The atmosphere within the pit should be tested before entry
- A standby person should be in constant contact and ready to lift the worker to safety with mechanical lifting equipment (winch, hoist, or pulley)
- Anyone entering a manure pit should wear a safety belt or harness with a lifeline tied to the mechanical lifting device



Report of two fatalities

On June 26, 1989, a 31-year-old male dairy farmer and his 33-year-old brother died after entering a 25-foot-square, 4-1/2-foot-deep manure pit inside a building on their farm. A pump intake pipe in the pit had clogged, and the farmer descended into the pit to clear the obstruction. While in the pit, he was overcome and collapsed. The victim's brother was standing at the entrance of the pit and apparently saw the victim collapse. He entered the pit an attempt to rescue him. The brother was overcome and collapsed inside the pit. Four hours later, another family member discovered the two victims inside the pit and called the local fire department to rescue them. The victims were pronounced dead at the scene by the coroner. The coroner's report attributed the cause of death in both cases to methane asphyxiation [NIOSH 1989b].

Manure pits

- Another important danger in manure pits is that a “solid looking” crust may form on the top.
 - However, it is extremely dangerous as they will not support the weight of a person
- Manure pits need to be fenced so that animals, kids and visitors can not access them
- Warning signs should also be placed around the pit to warn of the dangers



Ponds/ Lagoons/Water



Ponds/Water

- ◆ Ponds are an important part of the farm
- ◆ They are used to water livestock, conserve water and soil, store water for irrigation, fire protection and serve as a source of recreation
- ◆ Along with these benefits ponds also represent a hazard to those who live and work on the farm
 - ◆ Small children can fall in or wander away from adult supervision and drown
 - ◆ Workers can roll equipment into the pond and possibly drown
 - ◆ Pond maintenance also poses a risk to workers
 - ◆ Falling through thin ice in winter can result in hypothermia and death



Everyone with access to a farm pond should know how to swim and how to give CPR



Most accidents involve children and visitors to the farm



Things that you can do to make ponds safer

- NEVER swim alone
- Make sure children are supervised at all times
- Teach children to swim
- Remove underwater hazards such as rock, stumps, branches, and broken bottles
- Put a fence around the pond
 - These can help lower your legal liability
 - Put up warning signs
- Lock boats to trees or other structures to prevent use by untrained, unsupervised people



Posting pond rules is a reminder for all visitors to practice safety

Thin 12-14 foot
pole (floats)

Warning
Emergency sign



Place a rescue pole near the edge of the pond

- Post should be painted yellow and be equipped with a buoy and reaching pole
 - Buoy should be attached to a piece of nylon rope long enough to reach across the pond
 - If a swimmer is in trouble: use the reaching pole first
 - Throw the buoy as a second attempt
 - A rescuer should only enter the water as a last resort
-
- Place warning signs to let people know about deep water and sudden drop offs etc.
 - Control access to the pond
 - Don't let children near the pond without supervision

**IN CASE OF
EMERGENCY
CALL 911**

Life ring
(tied to rope)

Nylon rope



Abandoned wells and other surprises around the farm



Wells

- Old abandoned wells are occasionally located on farms
- These wells pose a safety risk to animals, visitors and children
- Wells can damage farm equipment (that may roll over a hidden well)
- They threaten groundwater supplies by allowing toxins to flow directly into water supplies



Wells

- Injuries or death from falling or drowning in a well can be lowered by:
 - Locating and marking each well
 - They are often hidden by grass, brush or collapsed buildings
 - Fitting the well with a cover that is difficult to remove and check it regularly
 - Wood can rot over time so it is not the best cover for a well
 - Fence off the area around the well
 - The best way to prevent accidents is to fill the well with concrete or other fill material



Animals can also get trapped in abandoned unprotected wells



Old and abandoned buildings

- Abandoned places can be quite irresistible and tempting to children and passersby
- Yet abandoned places are generally unsafe, either in their structure or environment
 - Old building are usually vulnerable to collapse, broken windows can cause injuries
- They are usually considered fire hazards (and are an arson risk)
- They are prime location for vagrants or wild animals to hide





Piles of trash around the farm can be a fire hazard, arson hazard and a risk to people, teens or children playing around them

Plus it can invite wildlife to settle there (snakes, skunks, foxes)

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Want more information?



| | |
|---|--|
| National Education Center for Agricultural Safety | www.necasag.org |
| Northeast Iowa Community College | www.nicc.edu |
| National Safety Council | www.nsc.org |
| Dubuque County Emergency Responder Training Facility | www.dubuquecountyfire.org |
| Progressive Ag Foundation | www.progressiveag.org |
| Agricultural Safety & Health Council of America (ASHCA) | www.ashca.org |
| National Institute for Farm Safety (NIFS) | www.nifsagsafety.org |
| AgriSafe | www.agrisafe.org |
| Farm Safety 4 Just Kids | www.fs4jk.org |
| Children's Ag Safety Network (CASN) | www.childagsafety.org |
| North American Guidelines for Children's Agricultural Tasks | www.nagcat.org |
| National Farm Medicine Center | www.marshfieldclinic.org/nfmc |
| National Children's Center for Rural & Agricultural Health & Safety | www.marshfieldclinic.org/nccrahs |
| Iowa Center for Agricultural Safety & Health (I-CASH) | www.public-health.uiowa.edu/ICASH |
| Great Plains Center for Agricultural Health | www.public-health.uiowa.edu/gpcah |
| National Institute for Occupational Safety & Health (NIOSH) | www.cdc.gov/NIOSH |
| National Ag Safety Database (NASD) | www.nasdonline.org |
| North American Agromedicine Consortium (NAAC) | www.agromedicine.org |
| American Society of Agricultural and Biological Engineers | www.asabe.org |
| Canadian Agricultural Safety Association (CASA) | www.casa-acsa.ca |
| Farm Safety Association – Canada (FSA) | www.farmsafety.ca |
| Farm and Ranch Safety & Health Association (FARSHA) | www.farsha.bc.ca |
| Iowa Fire Service Training Bureau | www.dps.state.ia.us/fm/fstb |