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

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
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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

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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 <u>we strongly recommend that you read them all</u>

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

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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)

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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:

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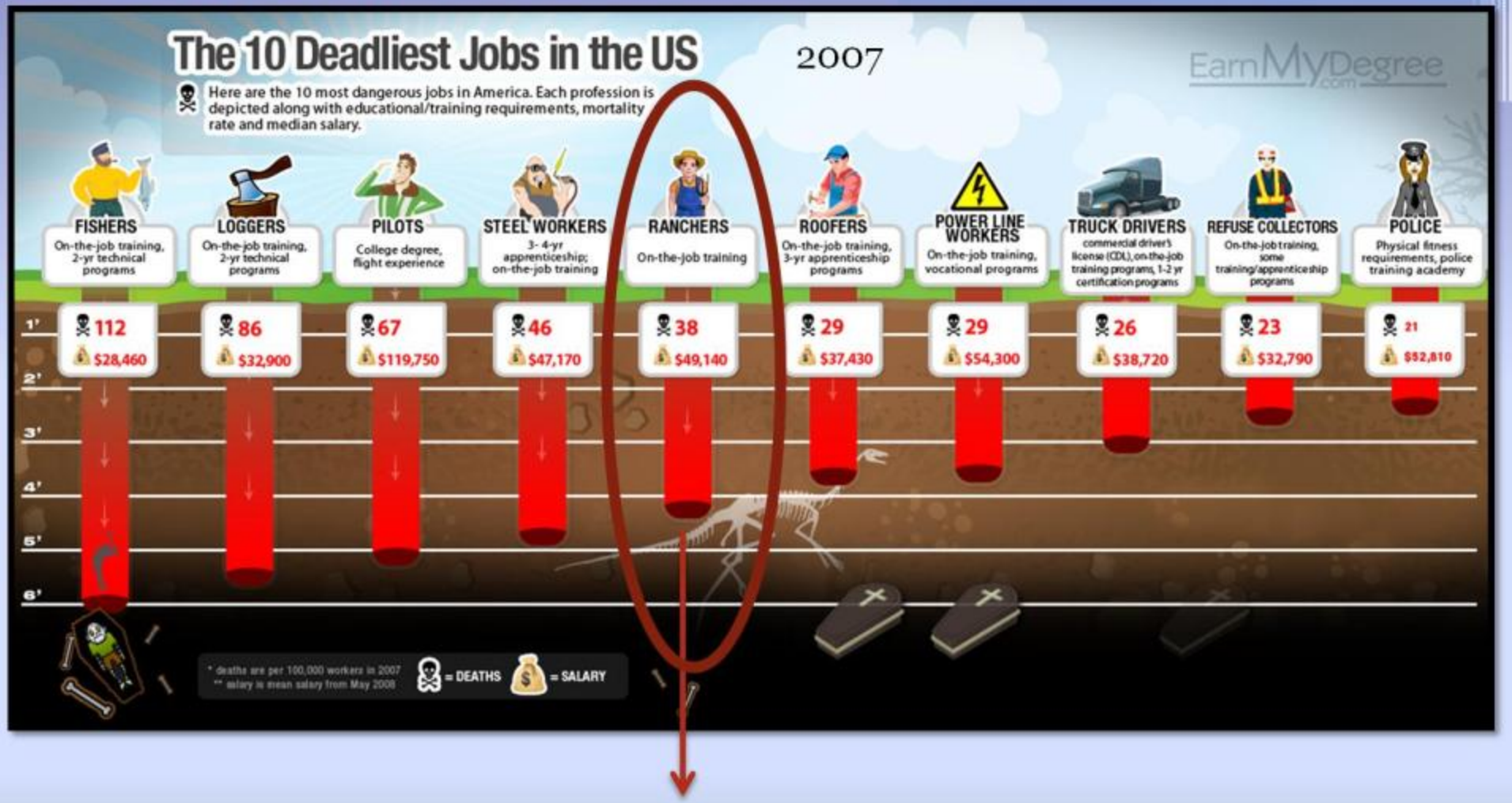

It doesn't make sense that being such an important element in our society and such a dangerous job, that there aren't more training programs and support for new and beginning farmers

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

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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:
Commodity storage & transfer Electricity Ergonomics • Back injury • Lifting • Repetitive trauma Farm machinery • Balers • Chain saws • Combines • Power take-off (PTO) • Roll-over protection • Safety guards • Tractors Fire Fuel storage (leaks and fires) Illumination (poor lighting) Lightning (shock and fire) Liquefied Propane [LP] gas Liquefied anhydrous ammonia Livestock handling injuries Physical/environmental hazards • Noise • Thermal (heat and cold) • Ultraviolet (sun light) • Vibration • Psychological stress • Sanitation (field) • Transportation (on & off road) • Welding	Asphyxiation/suffocation • Confined space • Entrapment (see commodity s.&t.) • Fumigation • Carbon Monoxide (combustion) • Silo gases (NO_2 and CO_2) Detergents Diesel exhaust Disinfectants including • Chlorine • Quaternary ammonia compounds • Organic iodides • Cresol-based compounds • Formaldehyde emitters Dusts (inorganic aerosols) Hydrogen sulfide (a key manure gas) Microbiologic organisms • Infectious microbes • Mold spores (mycotoxins) • Noninfectious bioaerosols • Parasites Nitrogen dioxide (silos & welding) Organic dusts - e.g. • Cotton dust • Endotoxin (on many organic d.) • Grain dust • Sugar cane (bagassosis) • Wood dust Pesticides (including application and harvest activities)	Arthritis Dermatoses - caused by • Heat • Irritant chemicals • Infectious microbes • Insects • Sensitizing chemicals • Sunlight Noise Induced Hearing Loss Immunologic diseases • Allergic rhinitis • Asthma • Dermatoses Noninfectious diseases • 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 NO_2) Organophosphate poisoning and sequelae Silo unloader's disease Zoonotic diseases

http://www.osha.gov/SLTC/agriculturaloperations/tables.html#table1

Children safety

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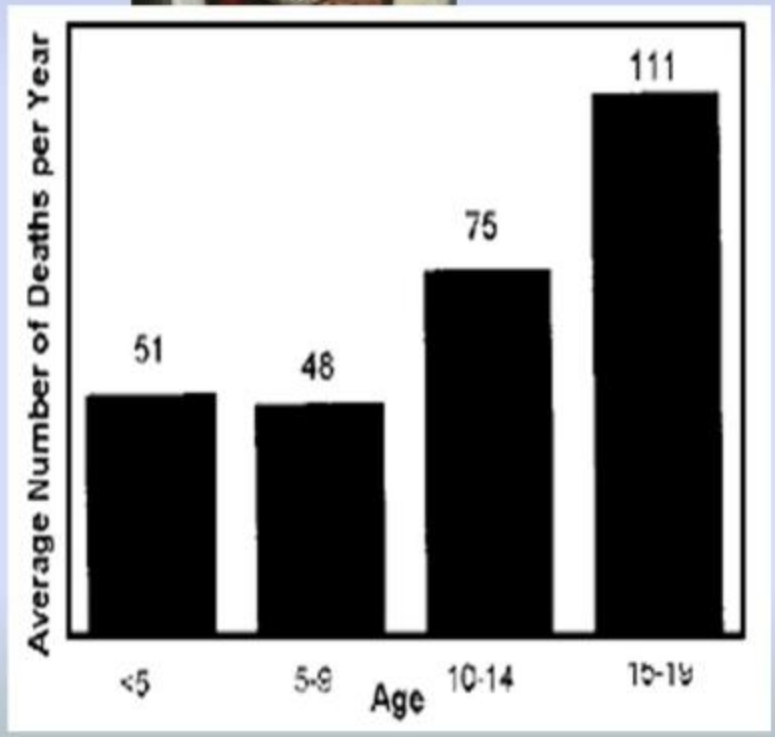
- Farm injuries are particularly high among children:
  - Between 100 to 300 youth die on farms annually
  - Children often work on the family farm
  - Children will play on equipment
  - Because children are always present, parents can become complacent



A good website to go for more information and details on farm safety is:

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OSHA

Occupational safety and health administration

http://www.osha.gov/

The OSHA website has important free information and fact sheets on how to safely perform many common farm activities

Farm Safety

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

Livestock

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Livestock handling

- <u>One out of six injuries on farms involve animals</u>
- The majority of animal injuries are to farm family members
- Livestock can pose numerous safety risks particularly to children

Teach visitors and children to respect animals and how to treat them well

Horse bite

Animal handling

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- Some general rules about animals are;
  - Larger animals pose a greater risk that smaller ones
  - Males are more dangerous than females
  - Mothers with young will attack if they perceive their young are in danger
    (this is true of all species including humans)
  - Never startle animals, always let them know when you approach by speaking in a calm voice
  - Animals that are cornered or feel threatened are more likely to cause injury

Farm pets

Kids 5 to 14 are the most often age group bitten by pets

Teach proper handling of pets to children so they do not injure the pet, who may then bit the child

- Make sure that all pets are properly vaccinated and neutered
- Never approach an animal that is acting hostile
  - Different diseases or injuries can make even family pets to be aggressive

Poultry

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- Roosters will attack people with their spurs
- If they can roosters will try and peck at the eyes
- Little children are often the target of their aggression
- Mother hens sitting on eggs will often peck at the hands and arms of those collecting eggs

Geese can be very aggressive when nesting and can cause injury by biting and using their wings to hit people

Poultry

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- Dust, ammonia and other gasses in chicken houses can also cause respiratory problems
- Working with poultry can also expose the handlers to serious pathogens such as *Salmonella*, *E. coli* and *Campylobacter*

Sheep

- It is common for sheep to jump at people if startled when approached from the front
  - They can hit with enough force to knock people down, and cause head and shoulder injuries. They can even break the legs of handlers
- Mothers with lambs can be very protective so care needs to be exercised when approaching them
  - Rams will butt with they heads and can injure those that work with them

<u>Children should never be allowed to access areas with rams</u>

Goats

- Goats will butt with their heads
  - Don't forget that horns can be very sharp!

<u>Children should never be allowed to access areas with the billy (or buck) goat</u>

Swine

- Pigs can bite hard enough to cause serious injury
- They can also hit you in the legs with enough force to break legs
- Pigs have been known to kill children that enter their pens. Children must be supervised when working with them

Cattle

- Cattle tend to kick forward more than backward so be careful when milking
- Bulls can be aggressive particularly when a cow is in heat. They can cause severe injuries with their heads and horns as well as by stepping on you
- Cows with calves can charge causing injury
- Care should be taken even when working with calves as they can still injure those working with them

Horses

- Every year many people are killed when working with horses
- They can bite, kick or stomp on workers
- Even a fall from a well trained horse can result in serious injury or death. Riders should always wear a safety helmet
- When riding watch out for low hanging branches
- Ride only horses that you are capable of handling

Teach children the proper way to work with and to respect horses

Horse bite

Wild animals

- Most farms are in rural areas so wild animals are often around
- Wild animals can bite and scratch
- They can spread diseases like rabies. Both to people, livestock and pets
- They can also transmit ticks and other parasites

Be prepared for anything when dealing with animals

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In general,
if an animal has a mouth it can bite
and if it has nails or claws it can scratch

If it is bigger, heavier, angrier or more scared than you, it can hurt you

Always be careful around animals

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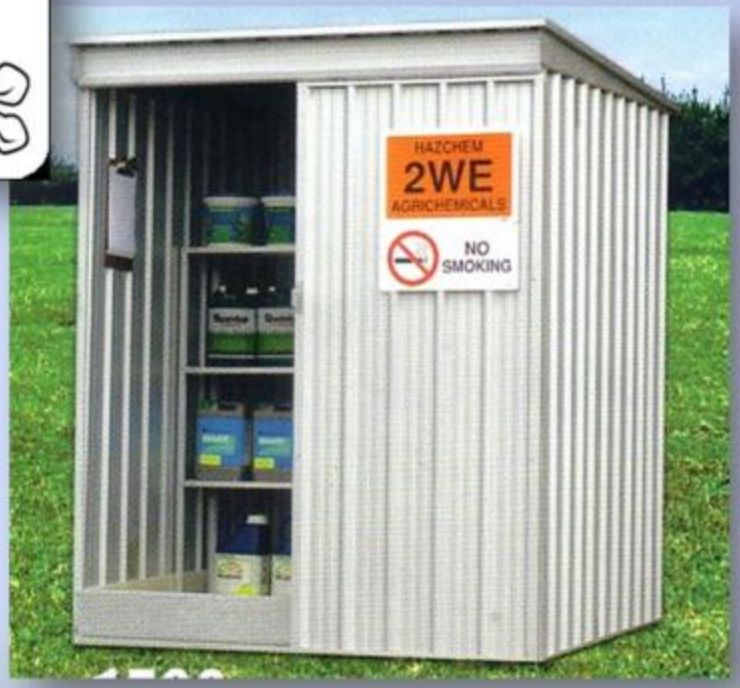

Chemicals

Chemicals/Pesticides

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- Sources of farm chemicals include
  - Pesticides
    - Insecticides
    - Rodenticides
    - Herbicides
    - Fungicides
  - Fertilizers
  - Medication for livestock
  - Fuel/oil for farm equipment
  - Cleaning supplies

Chemicals/Pesticides

- Always read and follow the directions of use, safety and warning label instructions that accompany any chemical
  - Any application different from the instructions may be not only dangerous but ILLEGAL!!
- If you can't understand them then call the help number

Never use a chemical until you know the risks involved

Chemicals/Pesticides

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- Chemicals should be stored in their original containers, with labels and instructions still attached
- Keep chemicals in a separate building/location from feed, seeds or fertilizers
- Signs should be present where chemicals are stored to warn of the dangers
- Make sure storage location is not accessible by children

Half of all pesticide related deaths are children under 10 years old

Chemicals/Pesticides

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- Always use proper personal protective equipment (PPE) when working with chemicals
  - Don't leave any bear skin exposed to chemicals
    - Gloves
    - Goggles/ face shield
    - Protective clothing
    - Breathing protection

Chemicals/Pesticides

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- Don't eat, drink or smoke while pouring, mixing or applying chemicals
  - Only prepare enough for immediate use
- Make sure to wash your hands and face after working with chemicals
  - Chemicals can enter your body through your skin
- Be sure to change clothing and wash up before playing with kids or pets as chemicals may be on your clothing
  - Wash work clothes separately

Chemicals/Pesticides

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- Dispose of empty containers in an approved way
  - Read the label for the approved disposal method
  - Check local regulations on methods of disposal

Some counties have regular pesticide and chemical disposal programs.

Contact your extension agent

Organic and natural pesticides (Biopesticides)

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- Even if a product is considered organic or natural, <u>it is still a pesticide</u>
  - In some cases they may even be more toxic than synthetic pesticides for some people or some animal species

Always read label and warning signs and handle accordingly

Learn how to read labels of pesticides, biologicals and other chemicals used in the farm

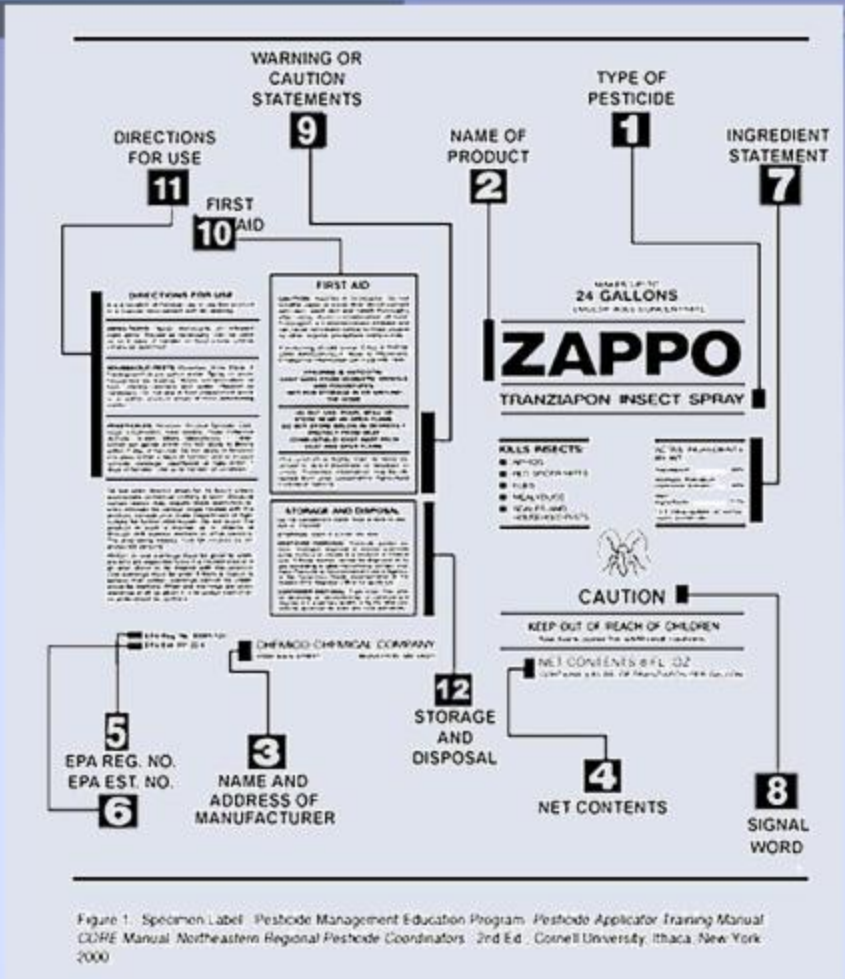

Figure 1. Specimen Label. Pesticide Management Education Program. *Pesticide Applicator Training Manual CORE Manual*. Northeastern Regional Pesticide Coordinators. 2nd Ed. Cornell University. Ithaca, New York. 2000

NEVER REMOVE A LABEL FROM A CONTAINER

ALWAYS KEEP CHEMICALS IN THEIR ORIGINAL CONTAINER

Toxic gases

Toxic Gases

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Anhydrous ammonia is used as a nitrogen fertilizer

Ammonia is also naturally produced as part of the decay of animal and vegetable matter and in urine

Ammonia exposure effects	
Readily detctable odor	20-50 ppm
Severe irritation of eyes, ears, nose and throat. No lasting effect with short-term exposure	400-700 ppm
Dangerous, less than 1/2 hour exposure may be fatal	2,000-3,000 ppm
Serious edema, strangulation, asphyxia, rapdily fatal	5,000-10,000 ppm
Immediately fatal	>10,000 ppm

Toxic gases

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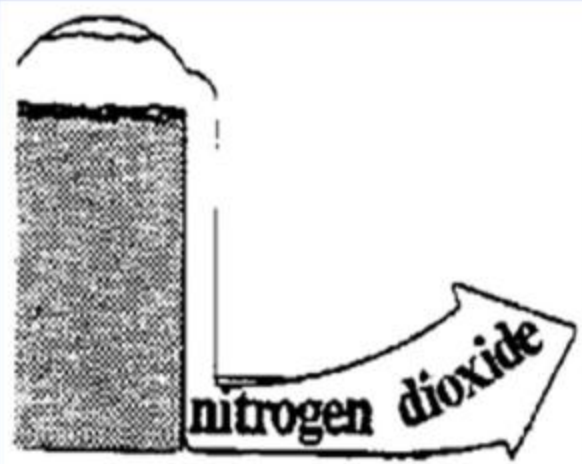
- Toxic gases can be a problem anywhere you have a confined space with no ventilation
- Never leave equipment running in a barn or garage with out providing ventilation
  - Exhaust and generator fumes can kill
  - Install a circulating fan in your work space and barn

Silo gas is formed by the natural fermentation of chopped silage shortly after it is place in the silo

- Nitrogen dioxide levels peak about 3 days after harvesting
- it leads to irritation to nose and throat and inflammation of the lungs
- High concentrations can cause little immediate problem but can cause death by fluid collecting in lungs (farmers can die in their sleep hours later)



Heavier than air, nitrogen dioxide will travel down the silo chute and into barn areas

- **Don't enter silos for 4-6 weeks after filling**

Make sure silos are ventilated before entering

Toxic gases

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Low oxygen conditions in confined spaces (such as silos, manure pits, storage areas) can be deadly

- At low levels (16-18% vs. the normal 21% in the atmosphere) there is an impairment of judgment and breathing without the victim realizing it
- A concentration to below 10% can result in death within minutes

Silo gas (nitrogen dioxide) is a well known danger associated with silos
Low levels of this gas can cause headache, eye, nose and throat irritation, but at higher levels it can cause pulmonary edema and possible death

Methane (biogas)
It is non-toxic, however it is highly flammable (at a concentration of 5-15% in the air). Anything that might create a spark – cell phones, radios, engines, clothing static or other non-explosion proof devices- could initiate an explosion

Never mix chemicals

Some chemical reactions can explode and others can result in fumes that cause coughing, shortness of breath, chest pain, irritation to throat, nose and eyes

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Storing chemicals

Flammable materials should be stored in an approved, dedicated, flammable materials storage cabinet

Chemicals should be stored no higher than eye level and never on the top shelf

Shelves should be firmly secured to the walls


Dust

Sources of dust include

- Roads
- Fields
- Livestock
- Crop harvesting/storage
  - Moldy hay
  - Opening silage pits

DUST

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The National Safety Council reports that almost **300 workers** are incapacitated each year due to respiratory conditions, mainly caused by dust

Dust in the lungs has both immediate and long-term effects:

Short term

It can result in fatigue or shortness of breath but also congestion, frequent respiratory infections such as colds, bronchitis and pneumonia

Long term

Asthma, emphysema, chronic bronchitis and farmer's lung

What can you do?

- Make a list of jobs where you might need a respirator
- Determine proper respirator for the job
- Compare the cost of disposable and non-disposable respirators
- Ask a professional to fit-test your respirator
- Routinely clean and inspect all non-disposable respirators. Discards disposable ones when dirty

There is no such thing as an all-purpose respirator

Respirators are available from the manufacturer, mail-order catalog, local implement dealer and farm supply stores

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United States Department of Agriculture
National Institute of Food and Agriculture

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Want more information?

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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