

# Ag Trauma - 1000 Ways to Die in Agriculture

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# Learning Objectives

- Identify the frequency and causes of agricultural injuries and fatalities in the United States
- Discuss reasons why farmers are injured in such high rates, and what can be done to prevent injuries
- Discuss EMS response times, various causes of delays, and extrication problems associated with farm injury incidents

Thanks to LaMar Grafft for the pics!











<http://go.funpic.hu>







SEA WOOD

Stacy #1525

SEA WOOD





# AGRICULTURAL TRAUMA

Mechanics of agricultural trauma

Tractors

Machinery

Animals

Confined spaces

Chemicals

First responder/EMS considerations

Prevention of agricultural trauma

Case scenarios



# AGRICULTURAL TRAUMA

550 farmers die per year/US

– 8 times the occupational average

140,000 disabling injuries per year

30 farmers die per year in \_\_\_\_\_



# AGRICULTURAL TRAUMA

## Why?

Stress

Long hours

Solitude

Weather

Hazardous situations

Familiarity

Tradition



# Mechanics of Agricultural Trauma

Tractors = 50% of farm fatalities

## Overturns

High center of gravity/rough terrain

50% of tractor fatalities

97% male

Side overturns = 85% of all overturns

Rear overturns, 85% of these are fatal

Spinal injuries

Crushing injuries

Long bone fractures







# Mechanics of Agricultural Trauma

## Tractors (cont.)

### Runovers

- 50% of these fall from tractor
- Children and other extra riders
- 27% are bystanders
- Bypass starting
- Spinal injuries
- Crushing injuries
- Long bone fractures













# Mechanics of Agricultural Trauma

## Tractors (cont.)

### Roadway incidents

- 13% of tractor fatalities

- Wide loads

- Slow speed

- Inadequate lighting or marking

  - Slow Moving Vehicle (SMV) signs

  - Reflective tape

- Left turns







NO  
PASSING  
ZONE

JCT  
220











# Mechanics of Agricultural Trauma

## Machinery

Tractors, combines and corn pickers

Slips and falls

Snapping rolls

23 feet per second

Belts and pulleys

Entanglement

Augers

Spinal injuries

Lacerations

















# Mechanics of Agricultural Trauma

## Machinery (cont.)

### Power take off shafts (PTO's)

1000 RPM (17/second)

540 RPM (9/second)

Amputations

Spinal injuries

Long bone fractures

### Grinder mixers and forage blowers

Primarily PTO problems











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GEHL

GEHL

Bodge



















# Mechanics of Agricultural Trauma

## Machinery (cont.)

### Augers

Hand/finger amputations

Massive lacerations



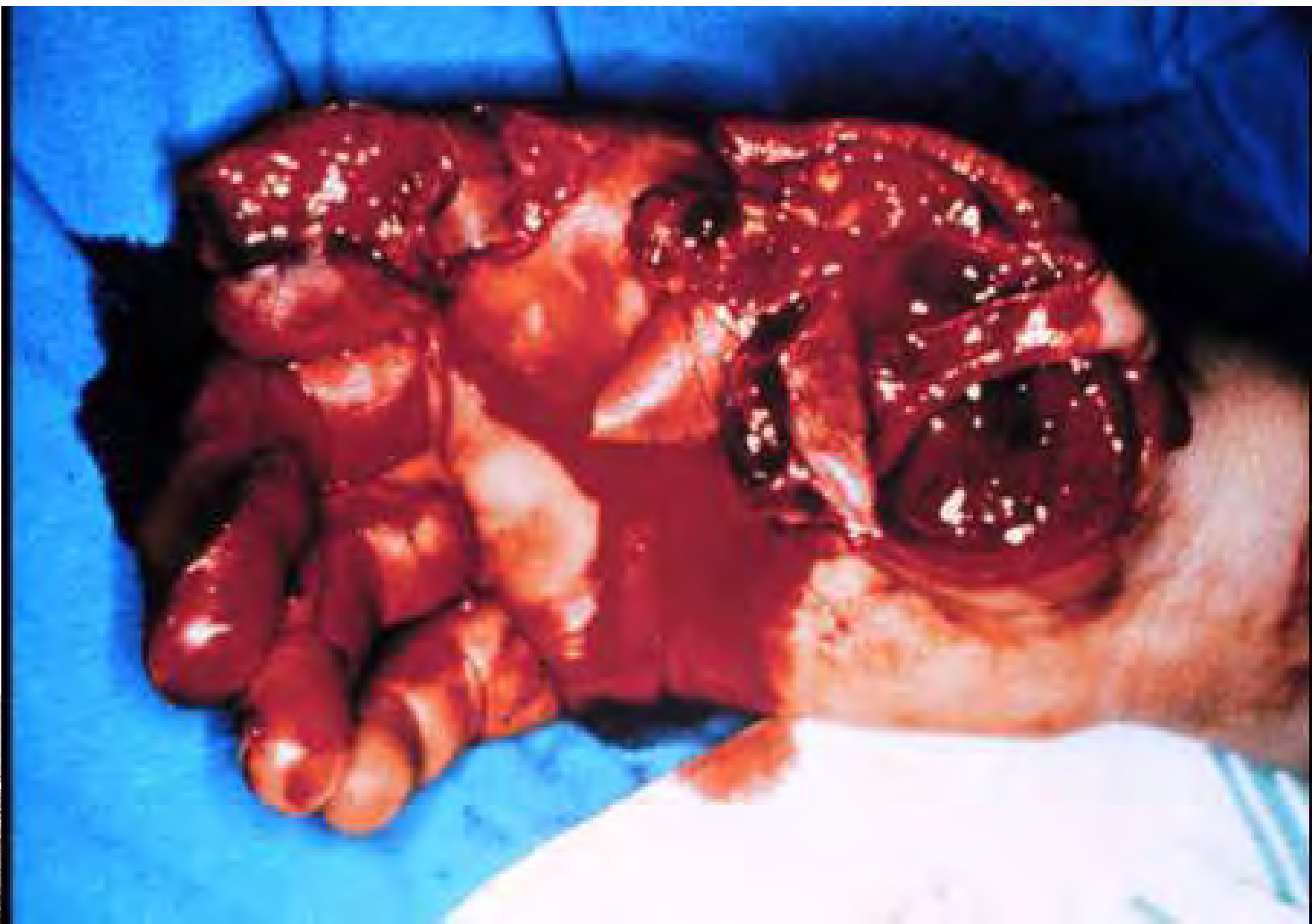








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# Mechanics of Agricultural Trauma

## Machinery (cont.)

### Balers

Drawn into equipment  
Amputations  
Lacerations

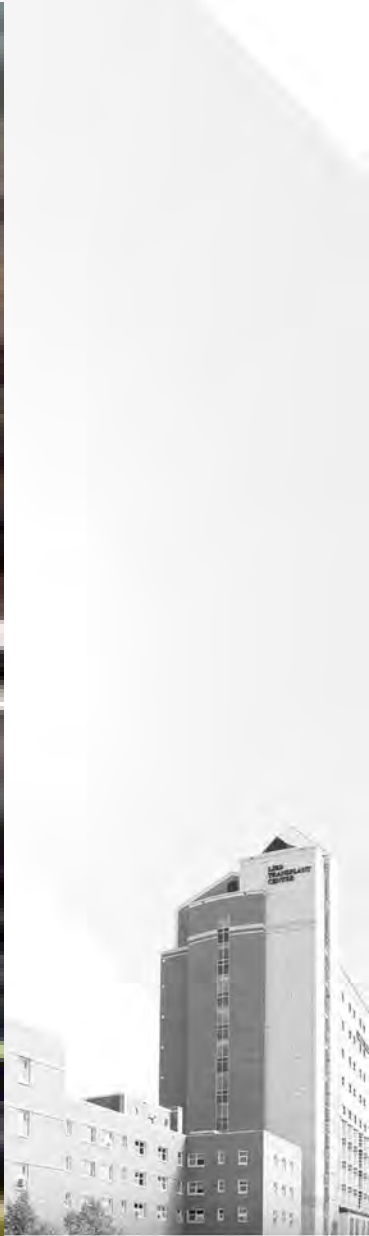












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# Mechanics of Agricultural Trauma

## Machinery (cont.)

Hydraulic injection

Pressure

Temperature

Pinch points









# Mechanics of Agricultural Trauma

## Animal injuries

### Aggressive animals

- New mothers

- Adolescent males

- Adult males

  - Size difference

    - 2500 pound bull

    - 75 pound child











<https://www.youtube.com/watch?v=XqZ4JUUDoZGs>





# Mechanics of Agricultural Trauma

## Animal injuries (cont.)

### Spooked animals

- Wild animals

- Startled animals

### Other

- Working/processing animals

  - Needle sticks

- Stupid tricks









1-

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# Mechanics of Agricultural Trauma

## Confined spaces

### Grain bins

Engulfment hazards

Quicksand

Bridging

Avalanche

Grain vacuum

Suffocation

Hypothermia



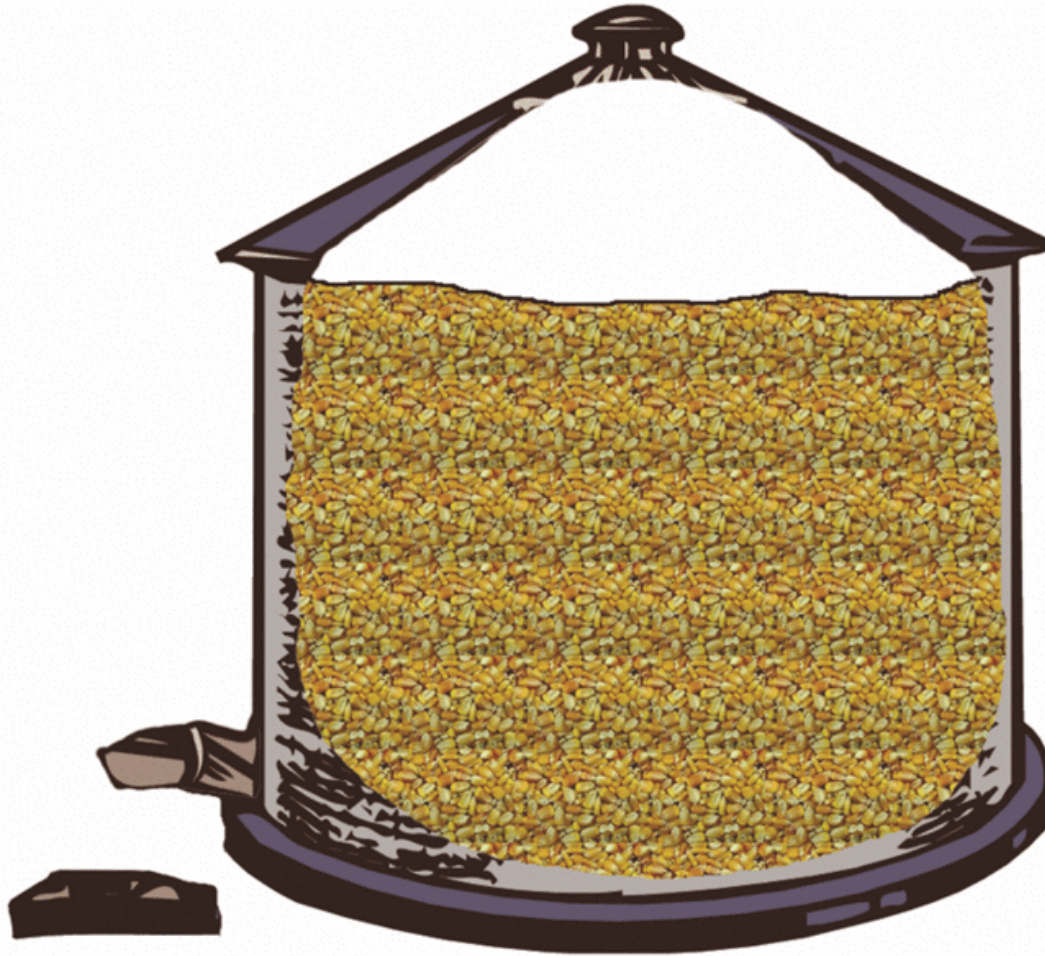


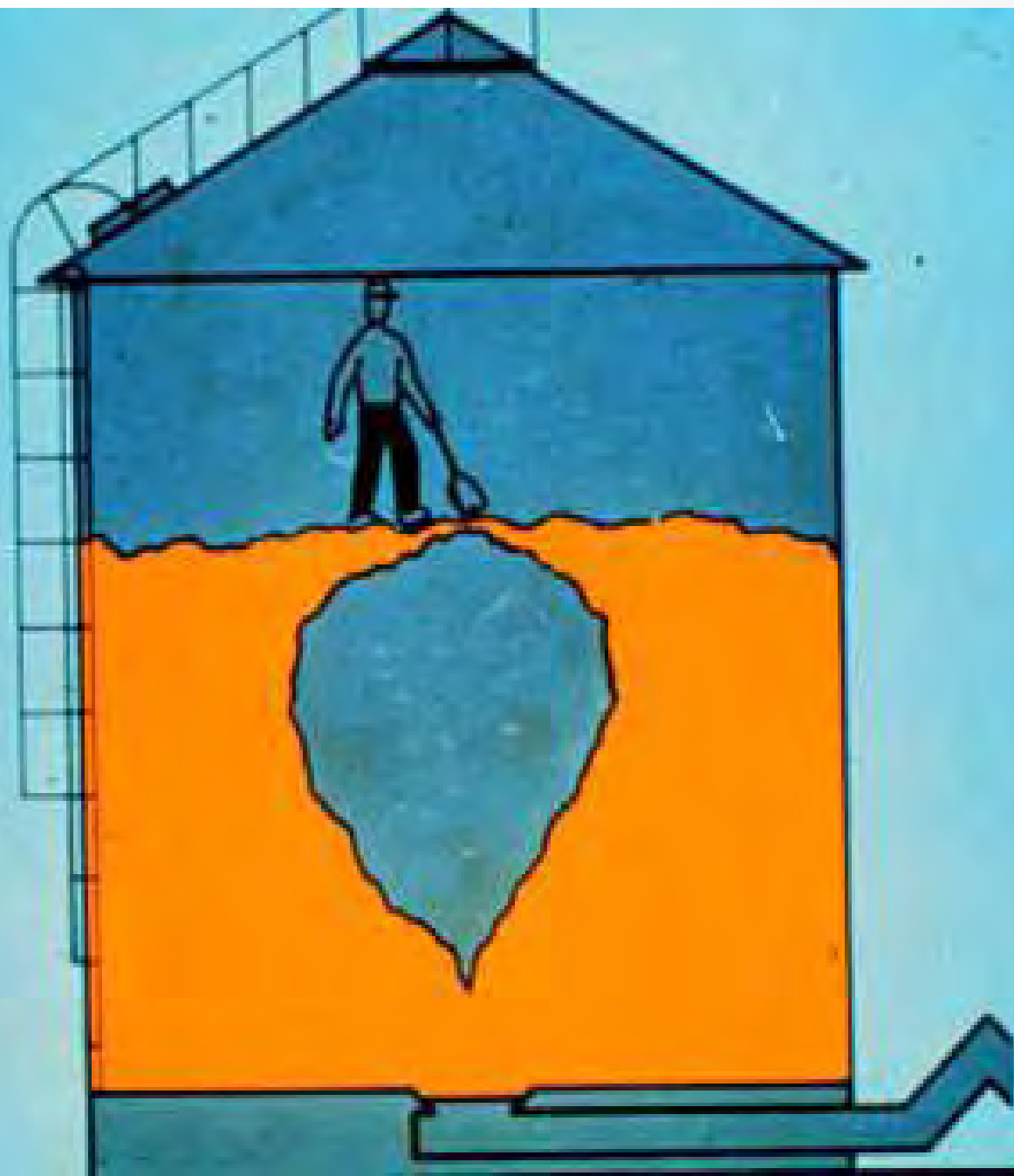


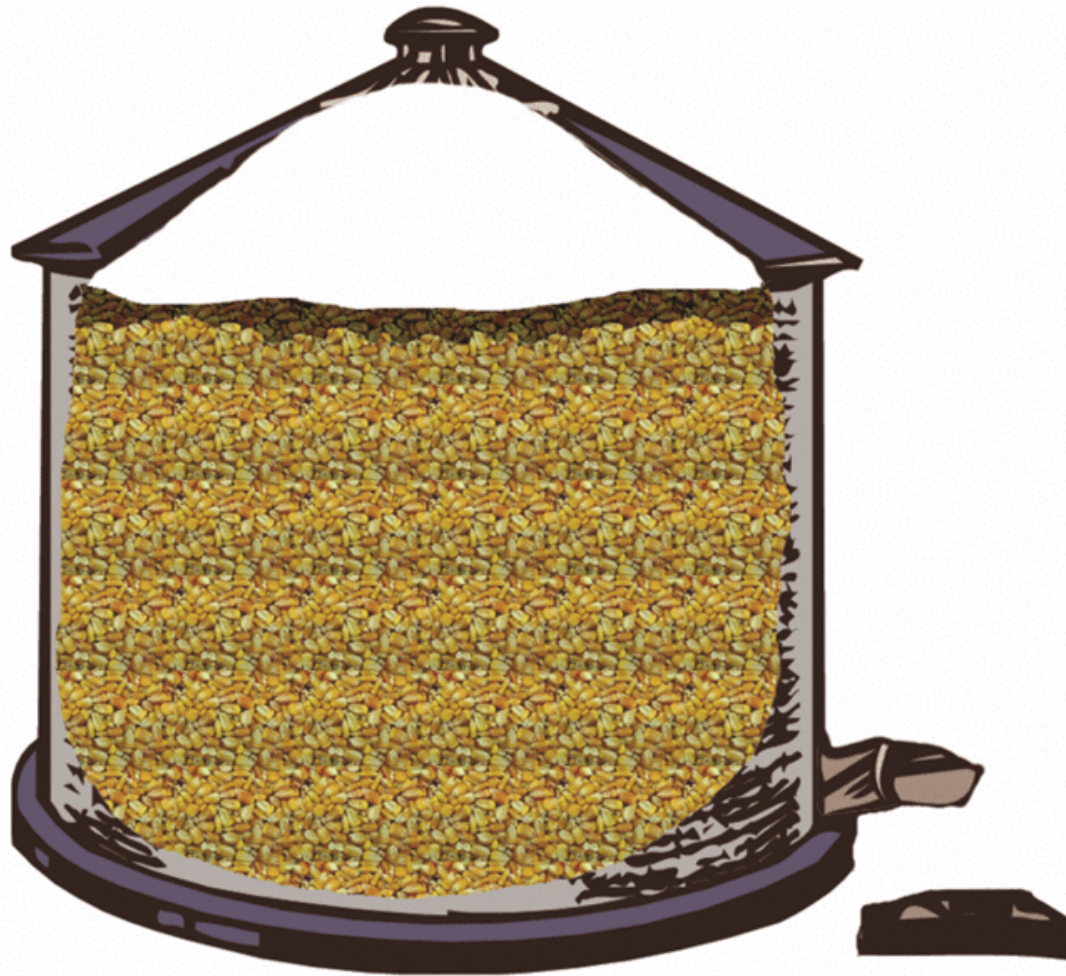
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# Mechanics of Agricultural Trauma

## Confined spaces (cont.)

### Silos

- Conventional

- Mechanical hazards

- Nitrogen dioxide (silo gas)

- Falls

- Oxygen limiting

- Reduced oxygen

- Mechanical hazards

- Falls





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# Mechanics of Agricultural Trauma

## Confined spaces (cont.)

### Manure pits

Hydrogen sulfide ( $H_2S$ )

Drowning

### Tanks

Assorted hazards







# Mechanics of Agricultural Trauma

## Agricultural chemicals

### Pesticides

Herbicides

Insecticides

Rodenticides

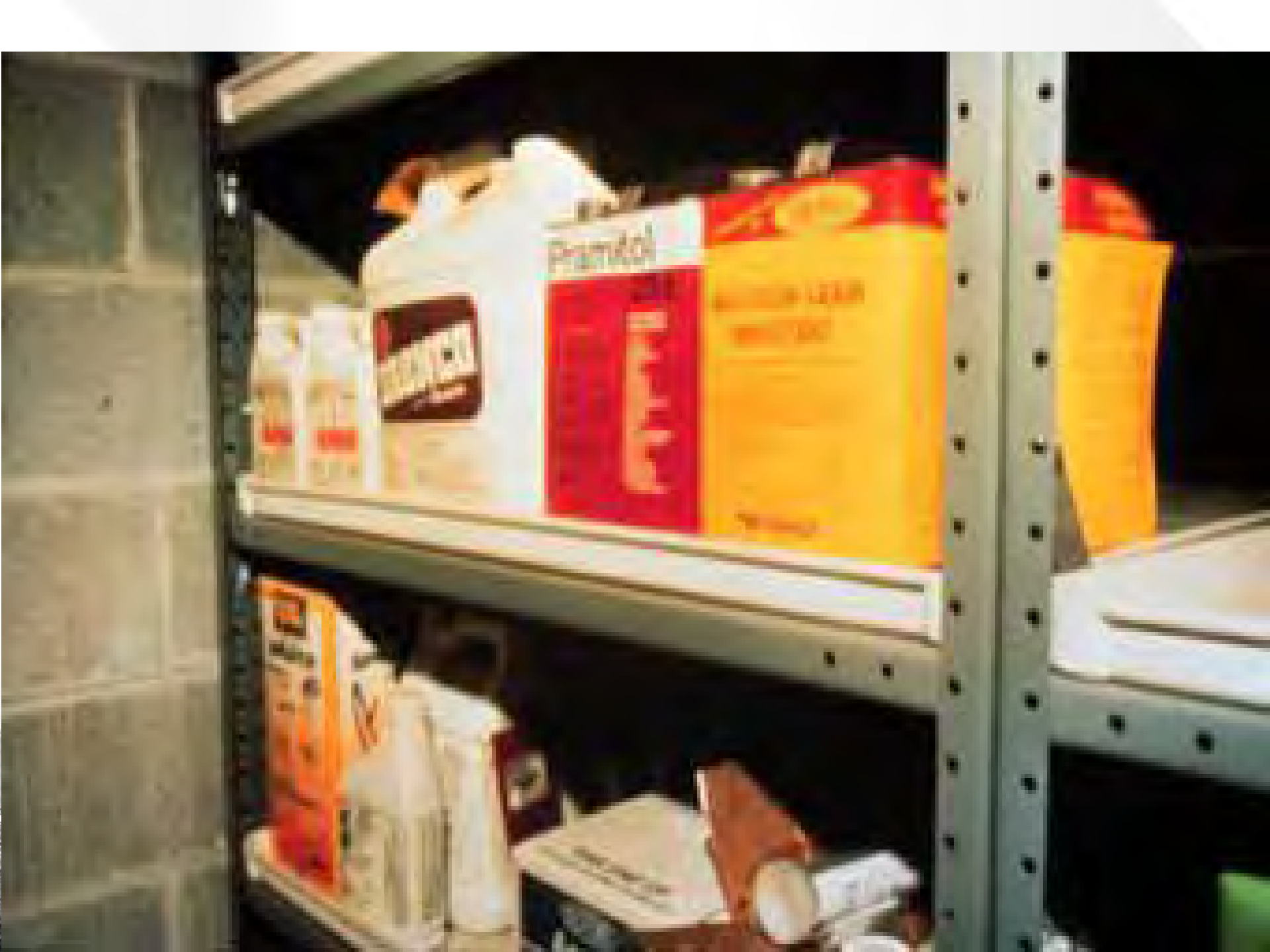
Fumigants











# Mechanics of Agricultural Trauma

## Agricultural chemicals (cont.)

### Fertilizers

Anhydrous ammonia ( $\text{NH}_3$ )

Hydroscopic

-28°F

Methamphetamine manufacture

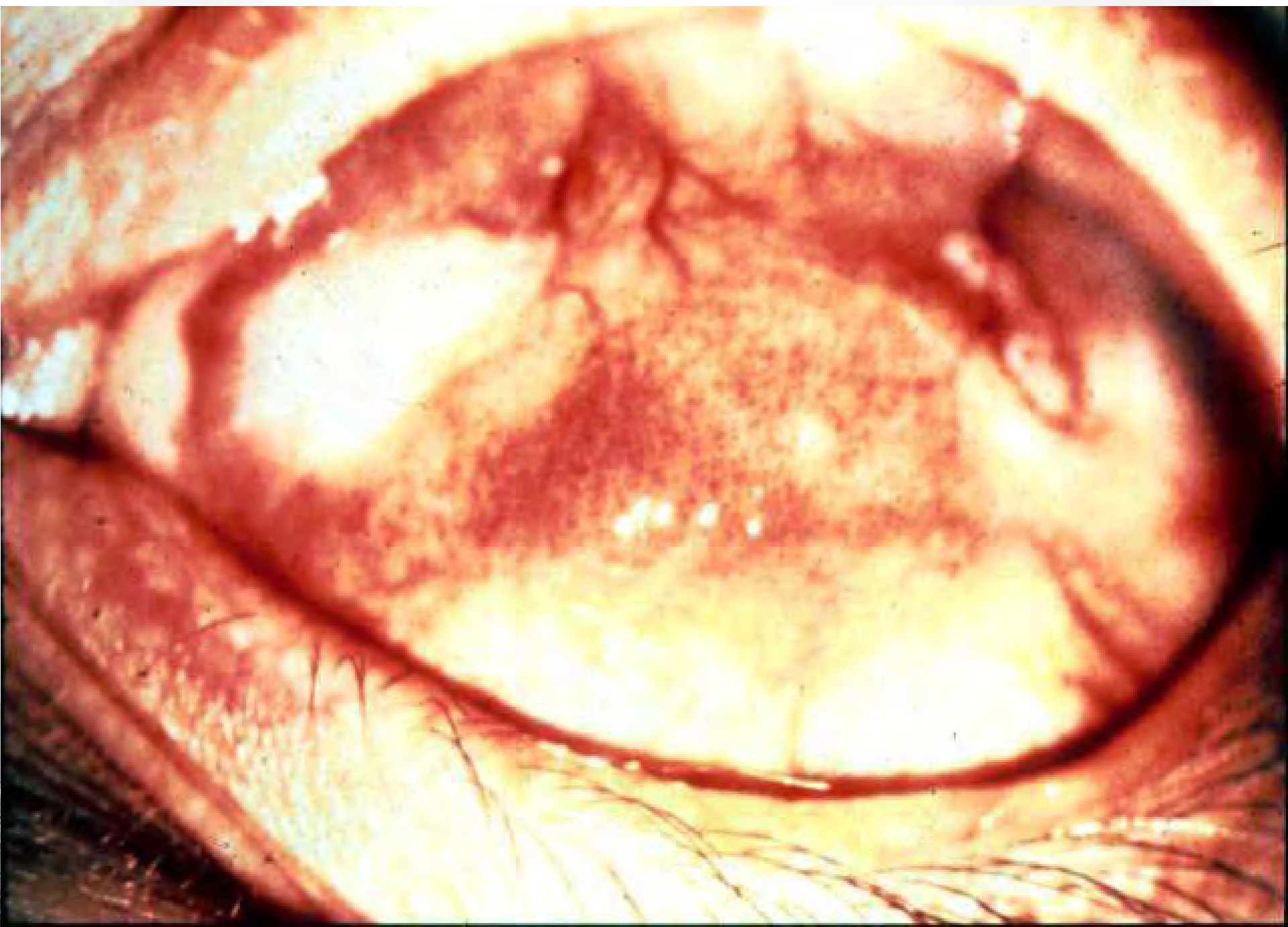
Ammonium Nitrate

Explosive when mixed with diesel fuel

Oklahoma City







# Mechanics of Agricultural Trauma

## Agricultural chemicals (cont.)

### Fuels

Diesel fuel

Gasoline

Kerosene

Liquid petroleum (LP)



# Mechanics of Agricultural Trauma

## Agricultural chemicals (cont.)

### Other chemicals

Antifreeze

Brake fluid

Cleaning fluids

Paints

Solvents





# Response Delays

## Patient location

### Time to make call

Delayed due to:

Distance

Weather

Barriers

Entrapment



# Response Delays

## EMT location

Time to receive call

Delayed due to:

Time of day

Full time job

Volunteer status



# Response Delays

## EMT location (cont.)

Time to arrive at scene

Delayed due to:

Distance

From town

From roadway

Physical access

Barriers



# Response Delays

## Entrapment

Under

Tractors, machinery

Inside

Grain bins, silos, manure pits, tanks, animal pens

Around

PTO shafts



# Extrication Concerns

## Training

- Time for training

  - Volunteers

- Cost of training

- Extrication problems

  - Specialized techniques



# Extrication Concerns

## Training (cont.)

### Specialized techniques

Heavy gauge steel

Difficult positions

Heavy/awkward loads



# Extrication Concerns

## Training (cont.)

### Specialized tools

- Air bags

- Hydraulic cutters/spreaders

- Saws

  - Reciprocating

  - Abrasive disc

- Air chisels







# Extrication Concerns

## Hazardous situations

Unstable equipment

Confined spaces

Chemicals

Animals

Distraught family



# Human Concerns

Severe trauma

Acquaintance with victim

Relative/friend

Critical Incident Stress Debriefing (CISD)



# Community Programs

## Specific agricultural safety ideas

AgriSafe Network

Certified Safe Farm

Farm Safety Days

Extension

NIOSH Ag Centers

National Education Center for Agricultural Safety



# Questions...

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