

Emergency Services Rescue Training, Inc.

Managing Agricultural Emergencies



Introduction To Farm Emergencies



Instructors

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Managing Agricultural Emergencies

Rescue Training

- ***Agricultural Emergencies Awareness***
 - *Introduction to Farm Emergencies*
- Emergency Rescue in An Agricultural Environment
 - Tractor & Machinery Emergencies
 - Managing Ag Chemical Emergencies
 - Agricultural Confined Spaces-Awareness/Operations
- Animal Emergencies in an Agricultural Environment
- Introduction to Feed Mill and Grain Elevator Fires
- Managing Farm Silo Fires

Course Goal

To raise awareness of emergency service personnel (fire, rescue, EMS, police) about the many hazards on farms that can cause serious injury, death and property loss and how to be better prepared to respond to and manage emergencies on farms.



Terminal objective

Upon completion of this module, the student will describe the importance of and need for a well coordinated incident management system (IMS) at agricultural incidents.



Specific objectives:

- List 5 hazards that might be encountered on a farm in their community;
- Describe two major differences they might encounter managing an emergency involving farm equipment versus automobiles;
- List 3 typical farm confined spaces;

Specific Objectives:

- List 3 components of a farm pre plan and describe the importance of performing pre plans on farms;
- Describe appropriate resources that should be requested to the scene of an injury emergency involving farm machinery, chemicals, structures, or animals.

The Agricultural Industry



MI Agricultural Industry

- # of farms = 52,194 total
- Land in farming = 9,948,584 acres
- \$ value of sales = \$8,678,050,000
- Each farm generates \$166,265 worth of product average

Sources: 2012 CENSUS OF AGRICULTURE-STATE DATA

Leading Ag Commodities-MI

Commodity	Cash Receipt	Average State Production
Corn	\$1,860,000,000	340,000,000 bu
Dairy	\$1,680,000,000	8,400,000,000 pounds milk from 366,000 cows
Soybeans	\$1,100,000,000	86,000,000 bu
Greenhouse/nursery	\$594,000,000	
Cattle/calves	\$480,000,000	
Sugar Beets	\$389,000,000	4,600,000,000 tons
Pork	\$357,000,000	
Wheat	\$318,000,000	45,000,000 bu
Chicken/eggs	\$230,000,000	
Potatoes	\$162,000,000	
Edible beans	\$160,000,000	4,000,000 cwt on 200,000 acres

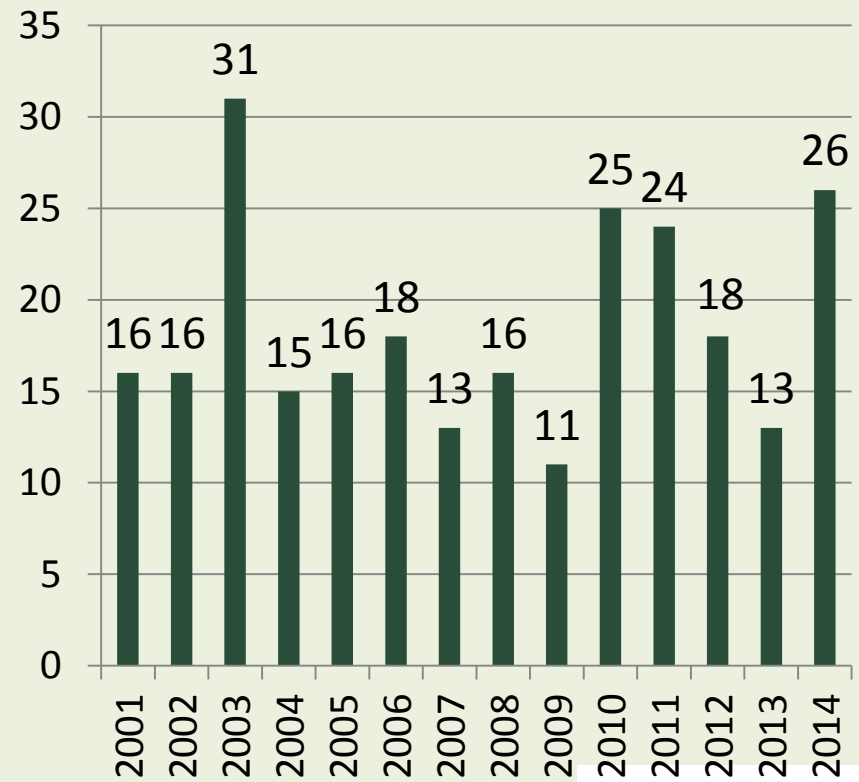


What is Happening in Michigan Agriculture?



Michigan Farm WR Fatalities

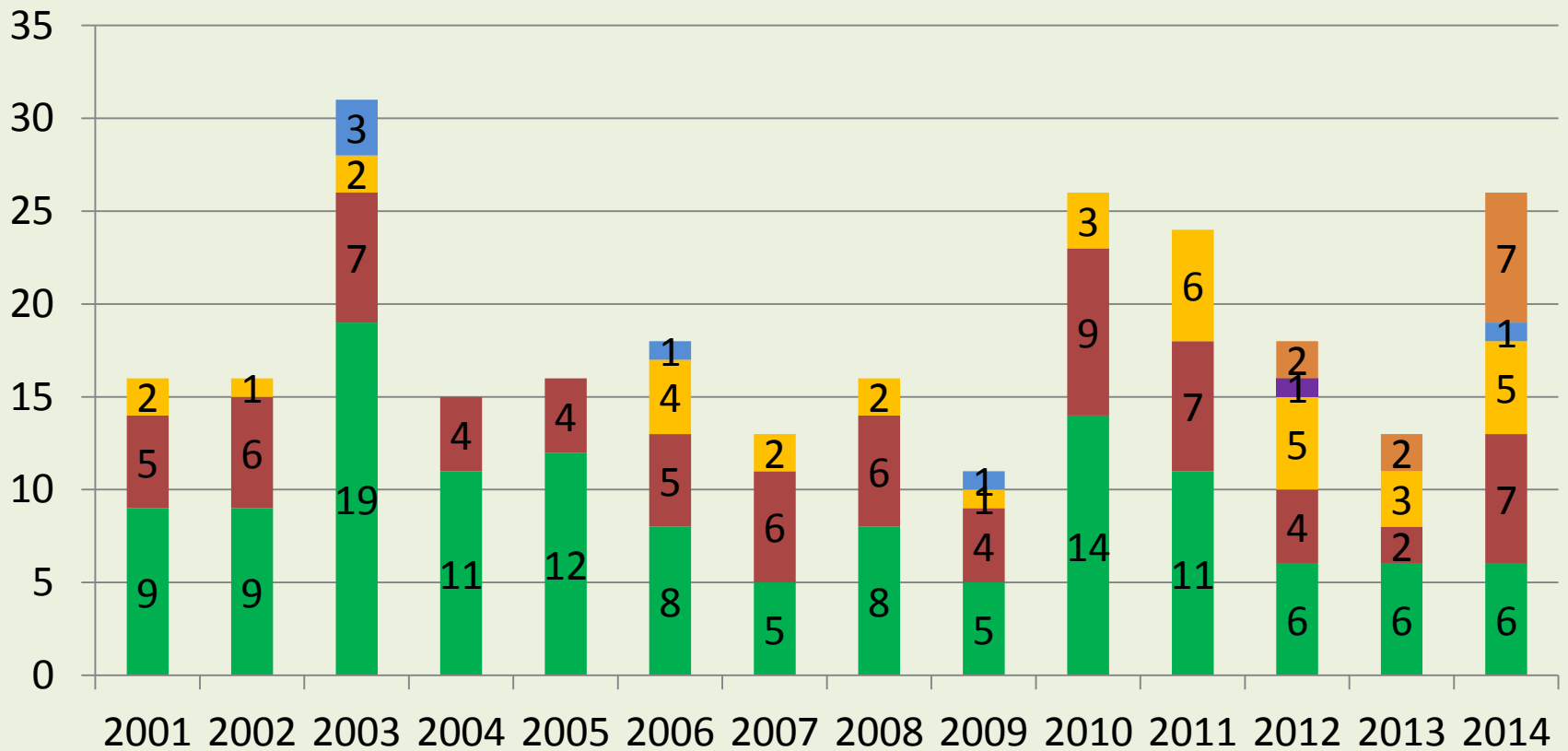
- 1,915 WR fatalities (all) (01-14)
- Agriculture: 259 (13.5%)
- 2014: 26 WR Fatalities



This information provided by
MIOSHA

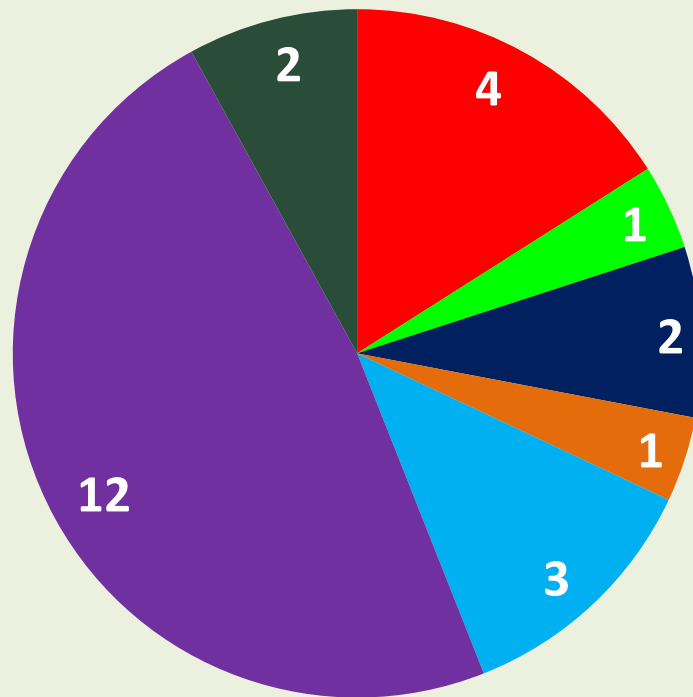


Ag WR Deaths by Ag Industry 2001-2014



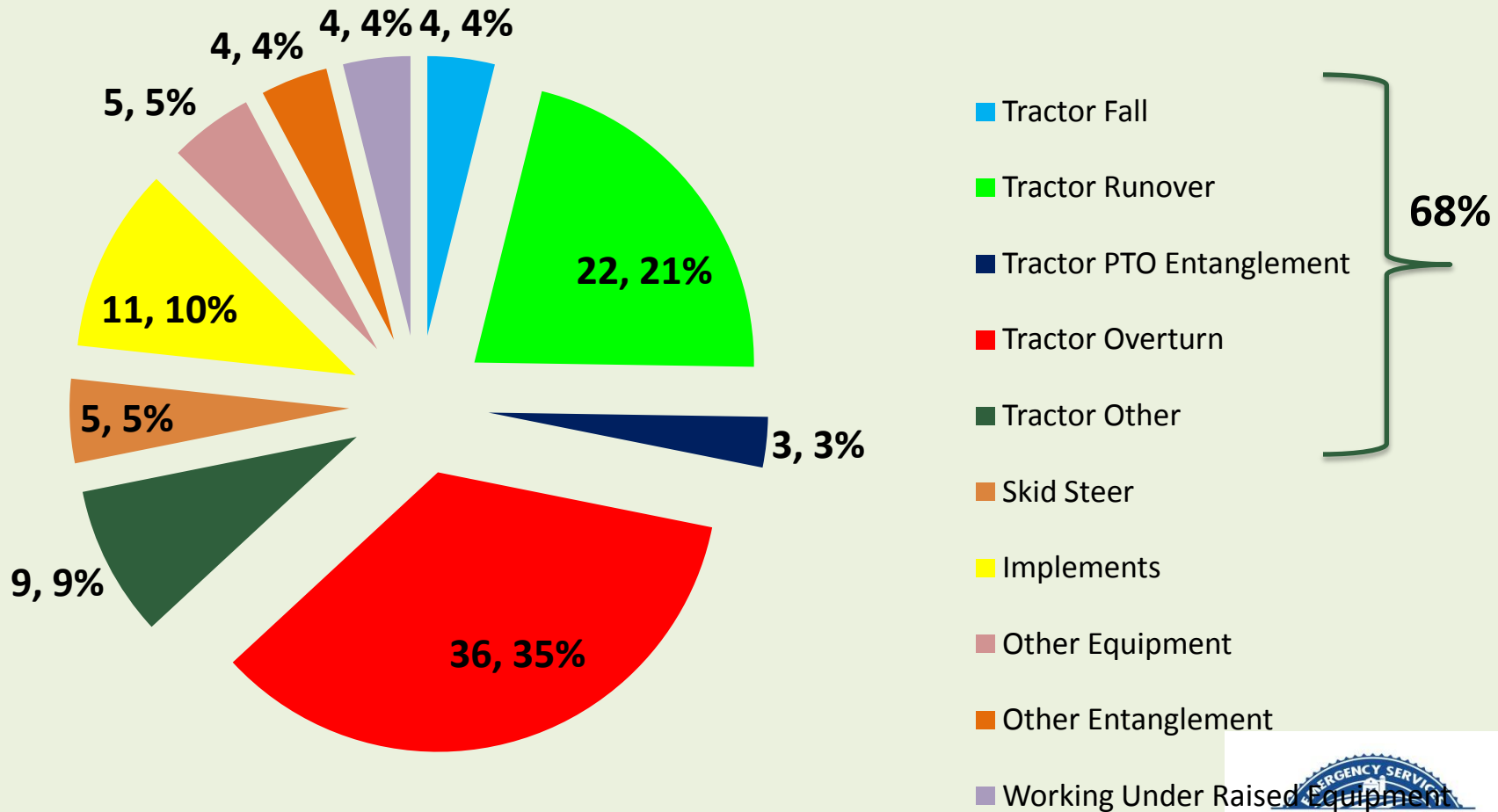
■ Crop (111)
 ■ Animal (112)
 ■ Logging (113)
■ Support (115)
 ■ Trapping (114)
 ■ Unknown

What Was The Cause of the 26 Deaths?



- Machine
- Motor Vehicle
- Homicide
- Drowning
- Suicide
- Struck By
- Animal

Causes: 103 Machine On-Farm Deaths



The Challenges of Today's Farmers



Increasing production costs vs. stagnant farm income

- Rising equipment costs.
- Higher operating costs.

Result:

Farmers must produce more and sell more to stay profitable.



New Technology Demands

- Necessary to be efficient.
- Expensive to implement.

Result:
Farmers must constantly modify their operations.



More Regulations

- Additional regulations may require costly changes which can be unaffordable for many farms.
- Local ordinances and zoning may restrict farm changes and growth.

Results:

Farmers struggle to “keep up”.



Commitment

- Farming is a 24/7/365 job.
- Great investment required.
- Risks are higher than other careers.

Result:

Farming is a business and career commitment.



Consumer Expectations

- Low food prices.
- Need for huge quantities.
- Demand for high-quality and consistent product.



Result:

Increased demands on farmers' capabilities.

Other concerns:

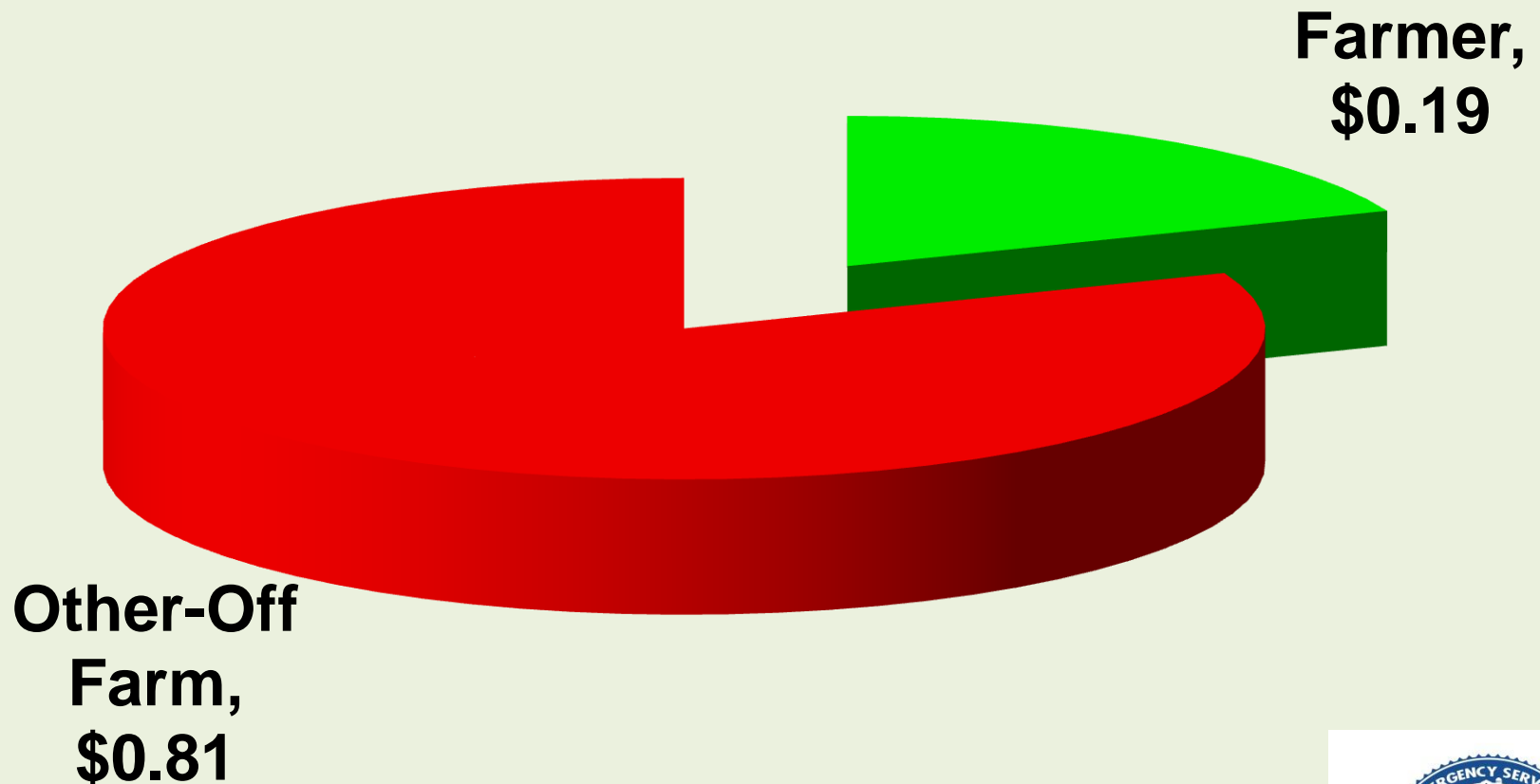
- Extremely weather dependent.
- Working in remote locations.
- Lack of knowledge.
- Poorly maintained equipment.

Result:

Increased risks to the farmer.

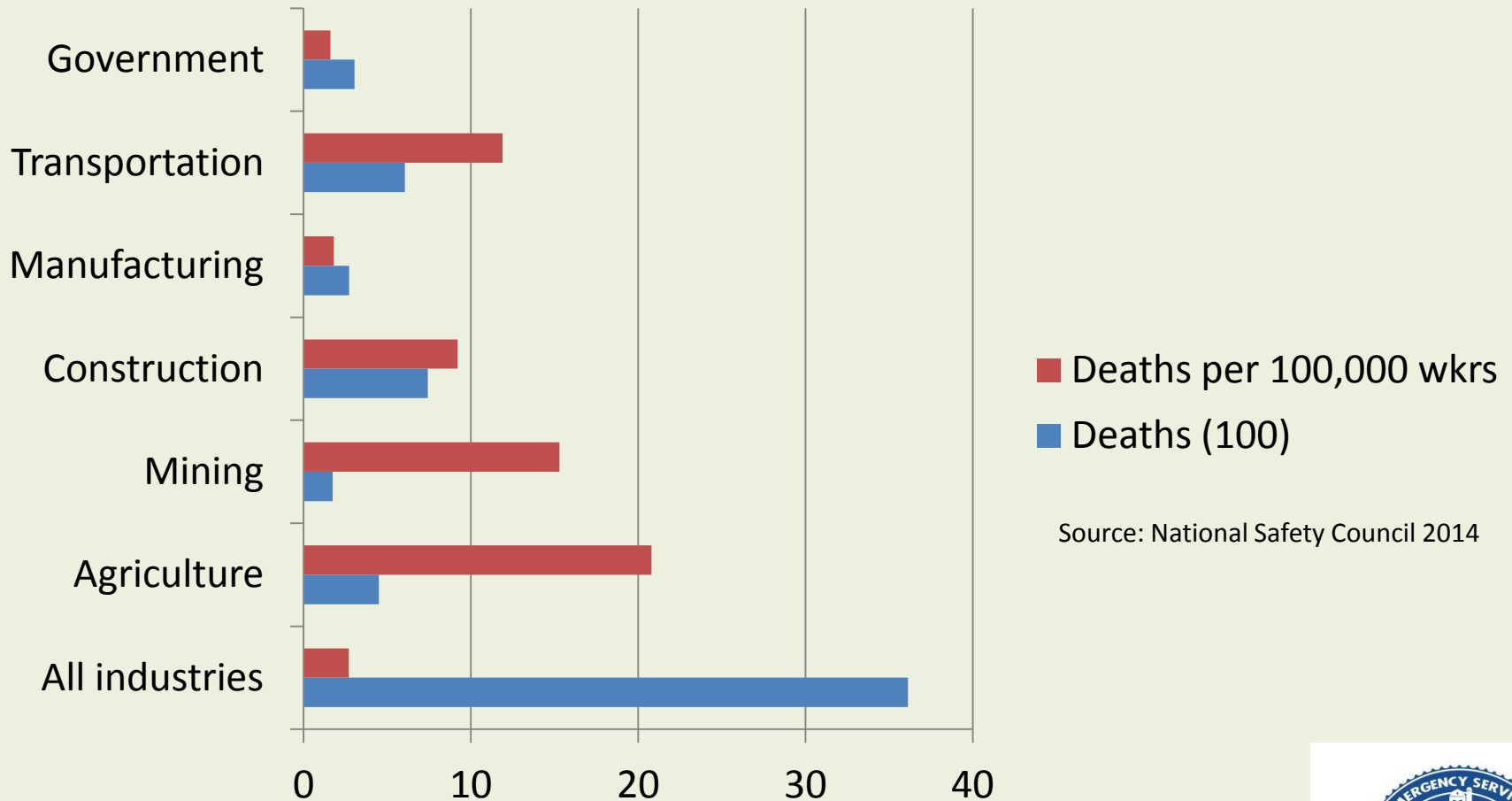
Farm Economics:

What does the farmer make on every \$1.00 spent on food?



Source: American Farm Bureau

Deaths and death rates per 100,000 workers



Source: National Safety Council 2014

Economic impacts

- Based on estimates from the National Safety Council, for every death, the cost to the family, community, etc. is estimated at **\$1,420,000**



Major Causes of Death & Injury:

- Tractor Overturns - side & rear
- Tractor Run-Over
- Machinery Entanglements - PTO, auger
- Animals



Barn Fires

- Poor surveillance



Agricultural Hazards in your community:

- Tractors & Machinery
- Animals
- Chemicals
- Structures
- Criminal Activity / Agro-/Eco-Terrorism

Tractors and Machinery

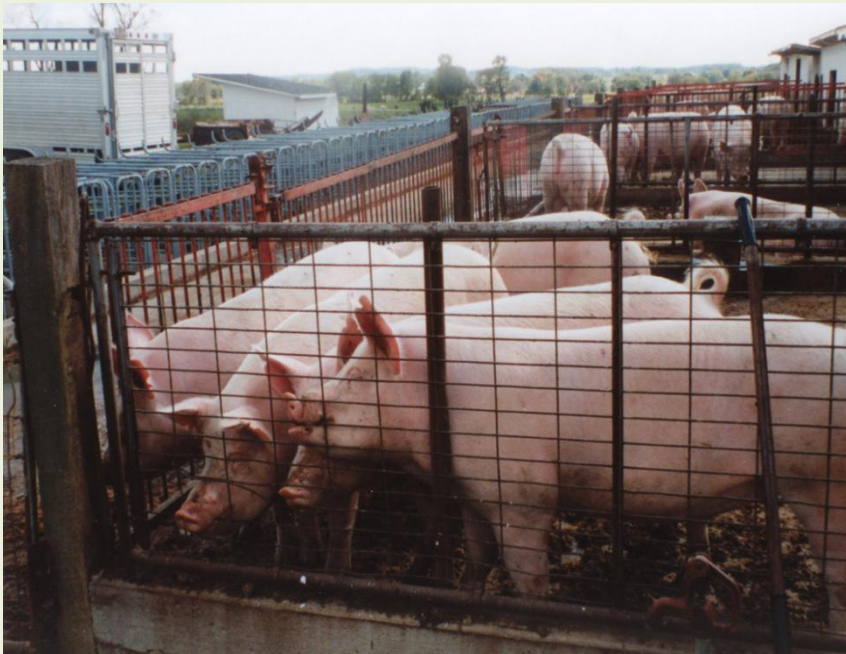


Sampling of Pennsylvania Tractor Deaths:

- Operator fell from tractor
- Tractor overturned onto victim pulling a log
- Tractor rollover during mowing operation
- Tractor rolled over onto victim working near a bank
- While dumping wood, skid steer tipped forward ejecting operator
- Child passenger crushed when machine turned over



Animals



Animals

- Cause of the majority of “injuries”.
- Normally scene will be secure when you arrive?
- Things out of their ordinary rile them.
- Cool, calm & collected approach – No lights & sirens **MUST** have “animal” people to manage them—preplan now!
- Cool, calm & collected approach – No lights & sirens.

Handling Animals

Fires

Accidents



Handling Animals Flooding



Handling Animals

Animal Rescues



Handling Animals

Building Collapses



You MUST have “animal” people to manage them - *preplan now!*



Michigan State Animal
Response Team

www.michigansart.org



Chemicals



Chemicals

- Seasonal
- Concentrated vs. dilute
 - Ex. 1 pint to 30 gallons of water
- Stay upwind, out of “material”



Chemicals

- ERG (“**Orange Book**”) will most likely NOT be a source of information.
- Container label is BEST source of info for initial management.
- **Greenbook** (www.greenbook.net) will be a resource for ag chemicals.

PROWL
3.3 EC herbicide

FOR USE IN SELECTED CROPS

ACTIVE INGREDIENT:	
pendimethalin (9-(1-ethylpropyl)-3,4-dimethyl-2,6-dibromobenzeneimine)	37.4%
INERT INGREDIENTS	62.6%
TOTAL	100.0%

(1 gallon contains 3.3 pounds of pendimethalin)
*Contains isomeric heptamer

EPA Reg. No. 241-337 EPA Est. No. 241-MD-1

KEEP OUT OF REACH OF CHILDREN
CAUTION
¡PRECAUCION!

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail).

FIRST AID
If swallowed, DO NOT induce vomiting. Call a physician or Poison Control Center immediately.
If in eyes, flush eyes with plenty of water. Call a physician if irritation persists.
If on skin, wash with plenty of soap and water. Get medical attention if irritation persists.

NOTE TO PHYSICIAN: Because of increased risk of chemical pneumonia or pulmonary edema caused by aspiration of the hydrocarbon solvent, vomiting should be induced only under professional supervision.

In case of emergency endangering life or property involving this product, call collect, day or night, Area Code 201-835-3100.

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS
CAUTION
Harmful if swallowed or absorbed through the skin. Causes moderate eye irritation. Avoid contact with skin, eyes or clothing. See booklet for Worker Protection Standard (45 CFR 177) requirements.

ENVIRONMENTAL HAZARDS
This product is toxic to fish. DO NOT apply directly to water, or to areas where surface water is present, or to overhead areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in adjacent aquatic sites. DO NOT contaminate water when disposing of equipment washwaters.

DIRECTIONS FOR USE
It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
PROWL, 3.3 EC herbicide should be used in accordance with the directions in the PROWL, 3.3 EC booklet and supplemental labels for registered uses not included in the PROWL, 3.3 EC booklet available through local AgCenter® Offices. Read all directions carefully before using.
See inside booklet for complete Directions For Use.
Chemigation: Refer to the PROWL, 3.3 EC booklet for directions for chemigation. Do not apply this product through any irrigation system unless the labeling instructions on chemigation are followed.

STORAGE AND DISPOSAL
DO NOT contaminate water, food, or feed by storage or disposal.
STORAGE: DO NOT STORE BELOW 40°F. Extended storage at temperatures below 40°F can result in the formation of crystals on the bottom of the container. If crystallization does occur, store the container on its side at room temperature (70°F) and rock occasionally until crystals re-dissolve.
PESTICIDE DISPOSAL: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.
CONTAINER DISPOSAL: For Five Gallons and Under: Triple Rinse (or equivalent). Then offer for recycling or reconditioning, or practice and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay at least 200 feet away.
For Bulk and Mini-Bulk: Return empty container to point of purchase for repackaging or recycling.

See Disclaimer inside booklet.

CYANAMID
American Cyanamid Company
Agricultural Products Division
Crop Protection, Chemicals Department
Wayne, NJ 07470 ©1993

10/93

2012
EMERGENCY
RESPONSE
GUIDEBOOK

A Guidebook for First Responders During the Initial Phase of a Dangerous Goods/Hazardous Materials Transportation Incident



Farm chemical storage



Structures



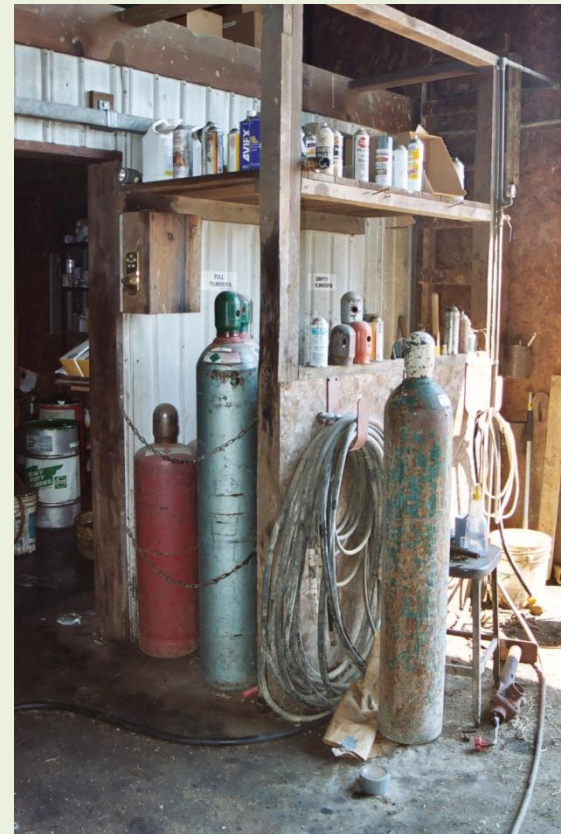
Structures

- Confined spaces
 - Silos, grain bins, manure storages, bulk tanks, wells, buried tanks, etc. etc. etc.
- Animal housing
- Machinery storage
- Farm shop
- Chemical storage
- Feed/commodity storage
- Other

Farm confined spaces



Farm Shop



Animal housing



Chemical storage

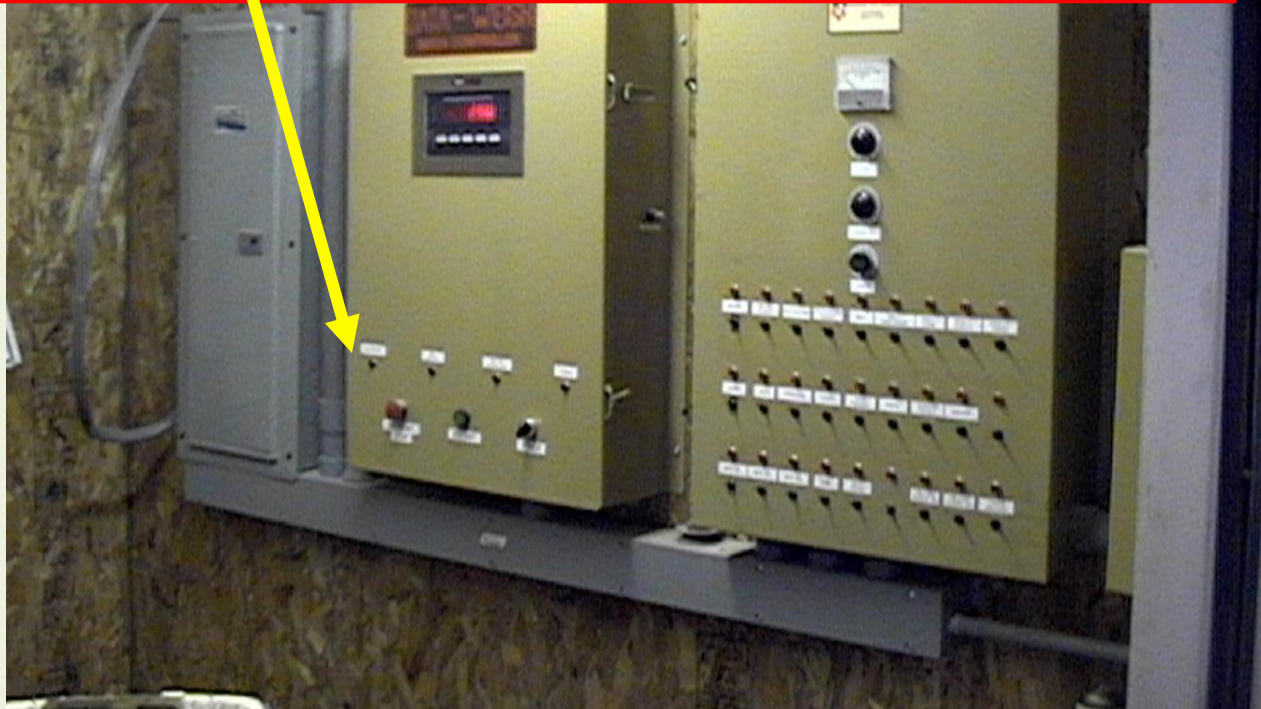


Feed/commodity storage



Feed/commodity storage





Manure storage



Criminal Activity – Agro-/Eco-Terrorism

Why target farms?

“Terrorism” versus **“Crime”**

While terrorism may not be a high priority to farmers crime prevention is.

Crime prevention = Terrorism prevention

1. Destroy the farm and product

- Causes economic loss
- Loss of production
- Years of work lost
- Setback in research



2. Political damage and influence

- Try to influence political outcomes(voting, zoning, ordinances, DEP)
- Change in policy
- Try to influence political decisions by contaminating the food supply or threat



What are the hot topics??

- ✓ Fur industry
- ✓ Genetic modification
- ✓ Agricultural chemicals
- ✓ Pollution
- ✓ Green technology
- ✓ Marcellus shale gas production



3. Psychological effect

- Causes terror
- Paralyze the nation and industry
- Setback in research



Criminal Activity – Agro-/Eco-Terrorism

Why target the farm?

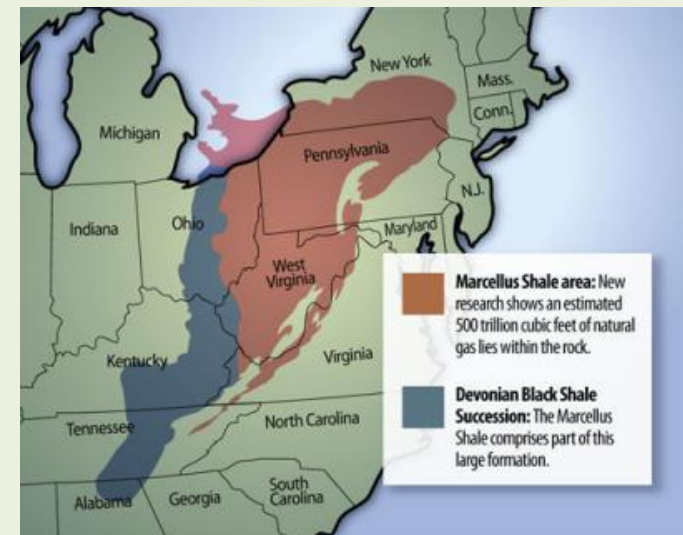
4. Personal attack

- Eliminate a religious group
- Eliminate a farm family
- Send a message to the farm



5. Profit

- Eliminate a competitor
- Eliminate a competitor's supply
- Ransom
- Purchase property at a profit



Why target the farm?

6. Revenge

- Against a religious group
- Against a farm family
- Send a message to the farm



Farms are typically easy targets



How could this picture be used to plot a crime against the farm?



Pre-Planning Farm Emergencies



Preplanning Farm Emergencies

- Farms are industrial facilities with many hazards
- Understand what emergencies can happen
- Visit each farm in your district to walk around/tour
- Preplan exercise-commit to writing-SOP/SOG
- Set up scenarios to test procedures and guidelines

Farm Response Team

- Fire / Rescue / EMS training-NFPA 1006 & 1670
- Specially trained & equipped-Ag rescue/trauma care
- Regional concept
- Ag technical advisors
- Annual practice



Farm pre-plan tour



Farm pre-plan SOP/SOG's



Farm pre-plan animal emergencies



Farm pre-plan machinery issues



Farm pre-plan test SOP/SOG's



Extrication & Treatment Issues

- How to extricate
- How to treat patient
- What resources are needed?
 - Mutual aid personnel
 - Mutual aid tools
 - Wreckers
 - Helicopter, ALS
 - Etc.



Toolbox and special tools



Special resources-machinery



Controlling Farm Emergency Incidents

“Managing the Chaos”
“Rescuer Safety – Patient Care!”

Key to a successful rescue:



Who's in charge?

Fire, Police, EMS

- Person in a burning car?
- Person on a cliff/tower?
- Person laying on a sidewalk?
- Person that has been shot?
- A working barn fire involving animals?
- A burning chemical storage facility?
- A person trapped under a tractor?

We are trained to deal with this...



But can we deal with this???



Priority of Rescue Operations





1. Preparation

- Training
- Education
- Preplanning / Pre-Incident Plan
- SOP/SOG development
- Tool and equipment maintenance
- Apparatus and personnel readiness



2. Dispatch/Response

- Getting from point A to point B in a timely, safe manner
- Most efficient route of travel, based on circumstances
- Request resources based on **effective** preparation
- **On average, 20%-25% of FF LODD's occur responding to, or returning from, calls.**



3. Scene size up (situational assessment) & Incident Command



- Complete 360° scene assessment
- Designed to ID hazards and value (patients/property)
- Determines the need and urgency for support operations and/or additional resources

4. Hazard Recognition and Control of risks

- Risk/benefit analysis
- Ability to control
- Options for Risk Mgt
 - Avoid
 - Eliminate/mitigate
 - Request tech help



5. Support Operations

- Additional resources needed to complete the task
 - Lighting
 - Additional EMS
 - Air medical support
 - Specialty services



6. Access

- Simple procedures work the best
- Be smarter than the equipment you're dealing with!
- Work from the simple to the complex
- Beware of stored energy



7. Patient Assessment & Care

- Initiate patient assessment immediately.
- Initiate care as soon as safe to do so.
- Provide care prior to, during, and post disentanglement.



- Initiate basic life support as soon as patient contact is made.
- Airway, Breathing, Circulation
- Spinal stabilization
- Bleeding control
- Oxygen therapy as per protocols.
- Advanced life support may need to be initiated prior to disentanglement/extrication
- Shock management
- Crush injury management

8. Disentanglement

- Removal of entrapment from around the patient may not be possible
- Piece of machine may need to stay with patient
- Amount of disentanglement needed varies based on patient's condition
- Always have a “plan B” (and C, D, E, etc.)

9. Extrication

- Remove the packaged patient
- Transfer the patient
- Methods employed vary depending on patient condition, position, and injuries
- Needs to be organized
- Patients don't come with handles!



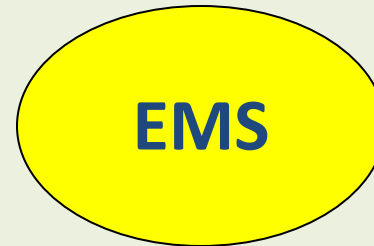
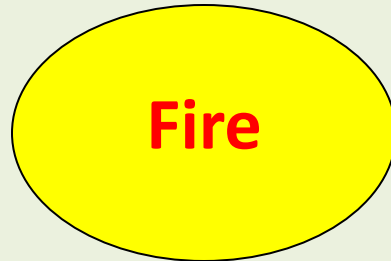
10. Termination

- Often the most overlooked phase
- Everything is returned to service
- Equipment readiness
- Scene is returned to pre-scene conditions
- Post incident review/analysis
- Critical Incident Stress Management (CISM)
- Documentation / After action report

Whose Role?

- Hazards acknowledged - *by who?*
- Hazards controlled/mitigated - *by who?*
- Patient condition and care concerns - *by who?*
- Patient treatment - *by who?*
- Extrication concerns - *by who?*
- Extrication procedures - *by who?*

Farm Incident Command System



- Hazard control

- Extrication

- Patient care

Collectively... effect a:

“Patient Oriented Rescue”

Why rescue operations fail.....

- F** Fail to understand the environment
- A** Additional medical complications overlooked
- I** Inadequate preparation
- L** Lack of teamwork & training
- U** not **U**nderstanding the logistical needs
- R** Rescue vs Recovery
- E** Equipment not mastered (understood)

Farm Accident Victim Treatment

- Trauma / Medical Protocols
- Mechanism of Injury
- High Index of Suspicion
- Golden Hour - Patient care protocols are based on our ability to get patients to definitive care within the “golden hour”.

What if we can't accomplish this?

Michigan
Adult Treatment Protocols
Adult Trauma

Date: May 31, 2012 Page 2 of 2

This protocol should be followed for severely injured patients meeting trauma triage guidelines and methodology, including chest injuries, and patients with symptoms of spinal cord injury, along with extremity weakness, numbness or sensory loss. It consists of assessment, stabilization, extrication, initiation of resuscitation, and rapid transportation to the closest appropriate facility.

Follow **General Pre-hospital Care Protocol**
Consider Rapid Extrication

- Stabilize spinal column while opening airway, determine level of consciousness. Refer to **Spinal Injury Assessment Protocol**.
- Manage airway ventilation per **Emergency Airway Procedure**.
- DO NOT HYPERVENTILATE
- Control major external bleeding
- Consider tourniquet use when applicable (refer to **Tourniquet Application Procedure**).
- If shock present, refer to **Shock Protocol**
- Initiate transport.
- Alert receiving hospital; note mechanism of injury.
- Consider vascular access
- If hypotensive, administer a NS IV/IO fluid bolus up to 1 liter, wide open, repeat as indicated.

Refer to **Mass Casualty Incidents Protocol** if appropriate

Refer to **Pain Management Procedure**

Chest Injury

- Control hemorrhage
- Diminished or absent breath sounds:
 - Closely monitor airway & provide for early maintenance.
 - Provide high concentration of oxygen, and early assistance of ventilation if indicated.
 - Look for life threatening respiratory problems & stabilize.
 - For sucking chest wounds cover wound with occlusive dressing sealed on 3 sides or FDA and MCA approved commercial device. Release dressing if worsened shortness of breath or tension pneumothorax.
 - Tension pneumothorax suspected, needle decompression, control external bleeding and complete spinal immobilization. Refer to **Pleural Decompression Procedure**.

Abdominal Injury


- Cover intestinal eviscerations with a sterile dressing moistened with sterile saline or water
- Cover the area with an occlusive material (aluminum foil or plastic wrap).
- Cover the area with a towel or blanket to keep it warm.
- Transport with knees slightly bent, if possible.
- **DO NOT PUSH VISCERA BACK INTO ABDOMEN**, unless prolonged extrication.

Injury Specific Treatments

- Follow appropriate protocols

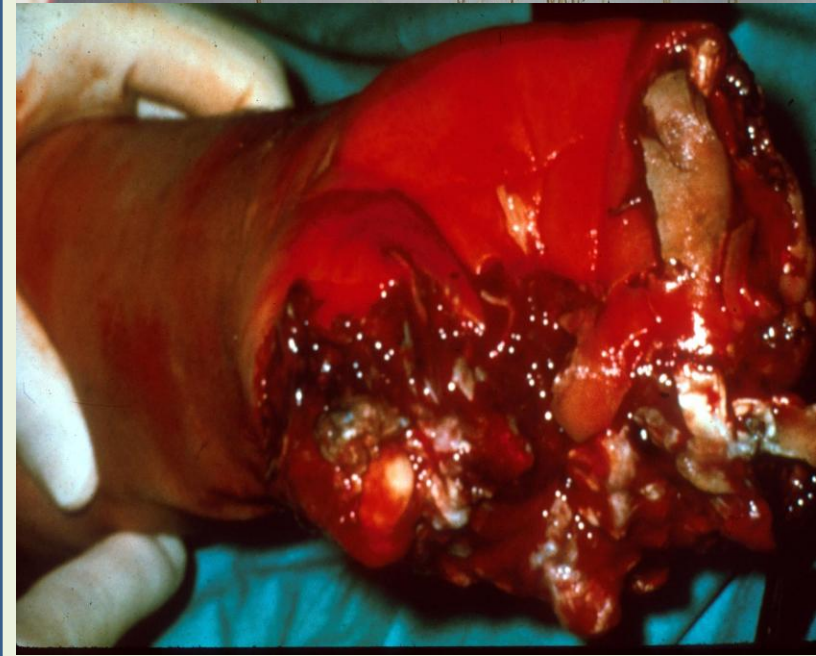
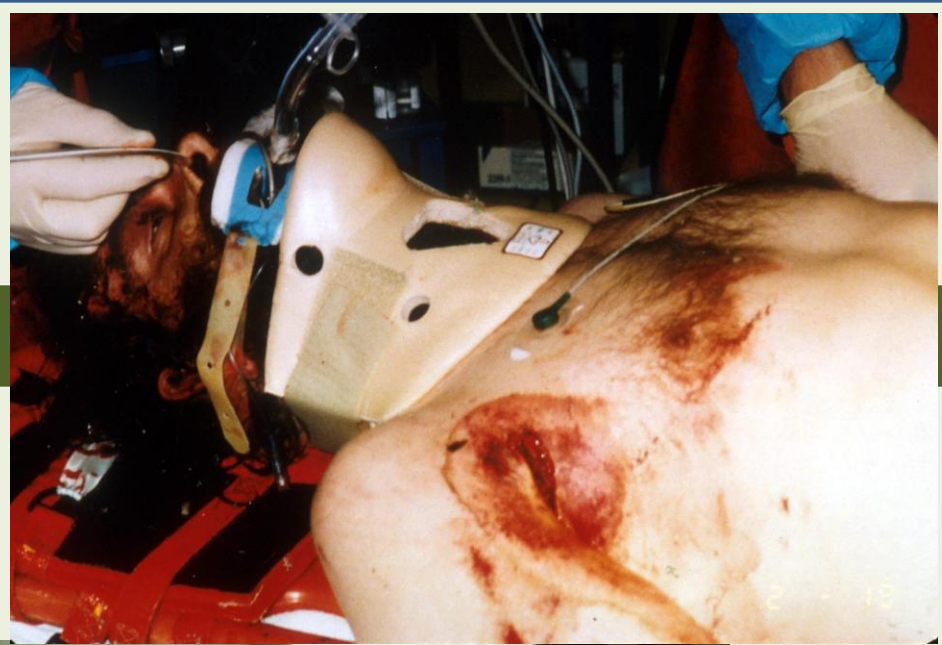
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MDCH Approval Date
MCA Implementation Date

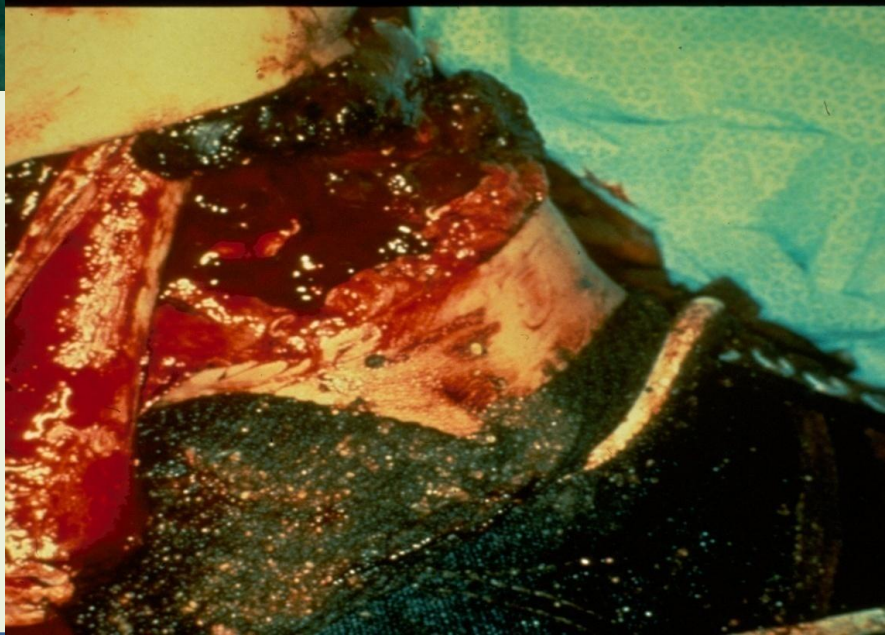
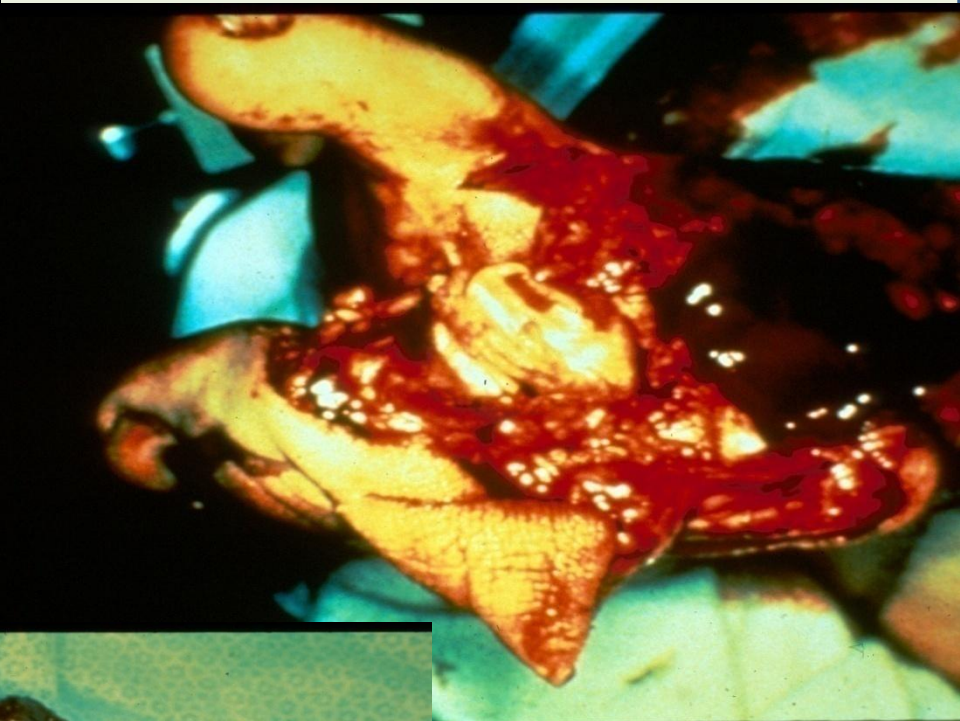
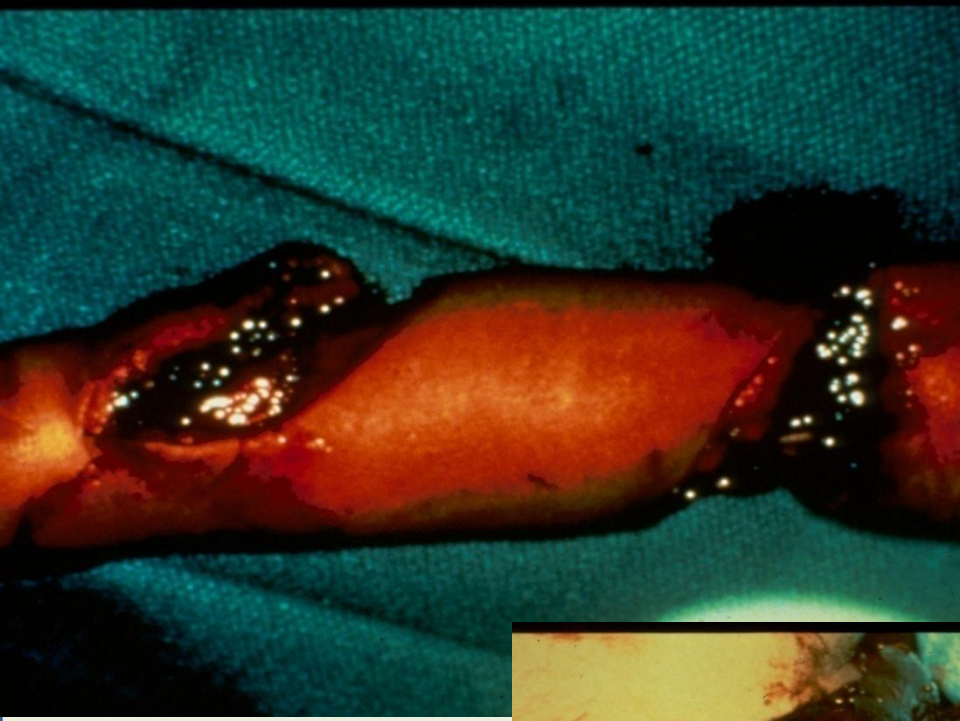
Section 1-2



Managing the farm trauma patient

- Responsive/unresponsive
- Airway/circulatory management
- Trauma assessment
- Initial management decisions-BLS/ALS
- Transportation decisions
- Care prior to and during disentanglement/
extrication efforts
 - Blunt trauma
 - Internal/external injuries
 - Head/neck/spine
 - Crush injuries

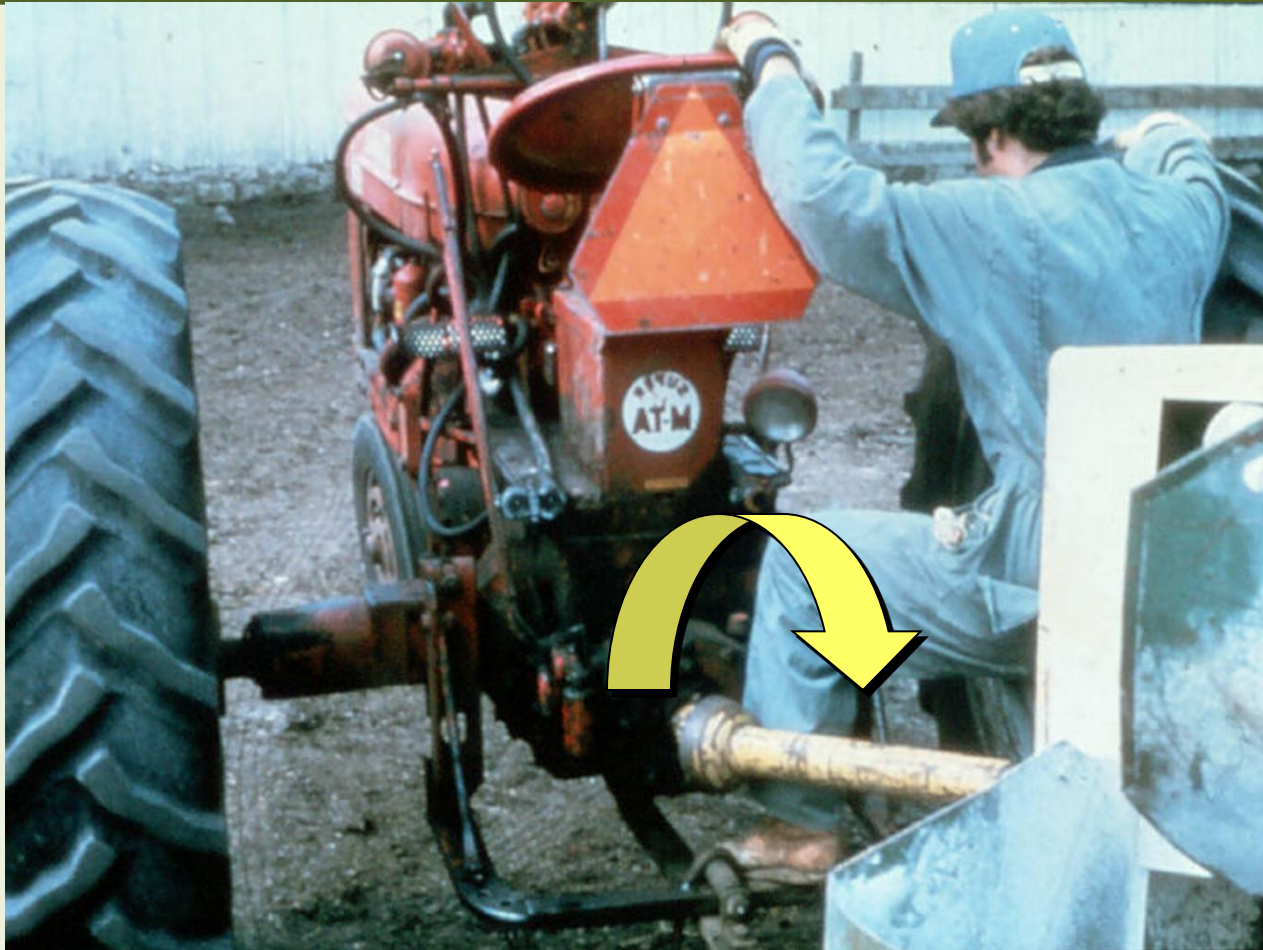


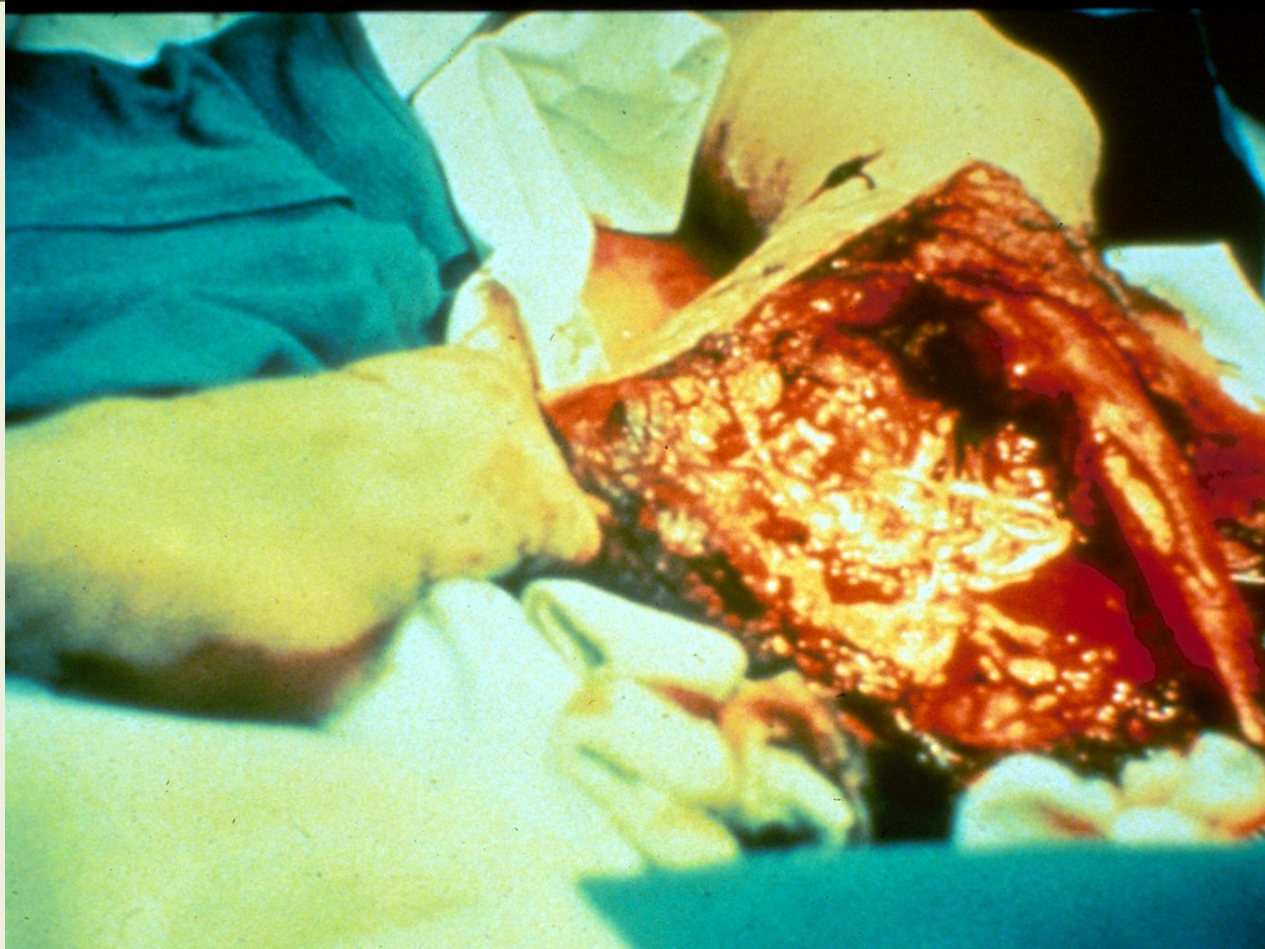


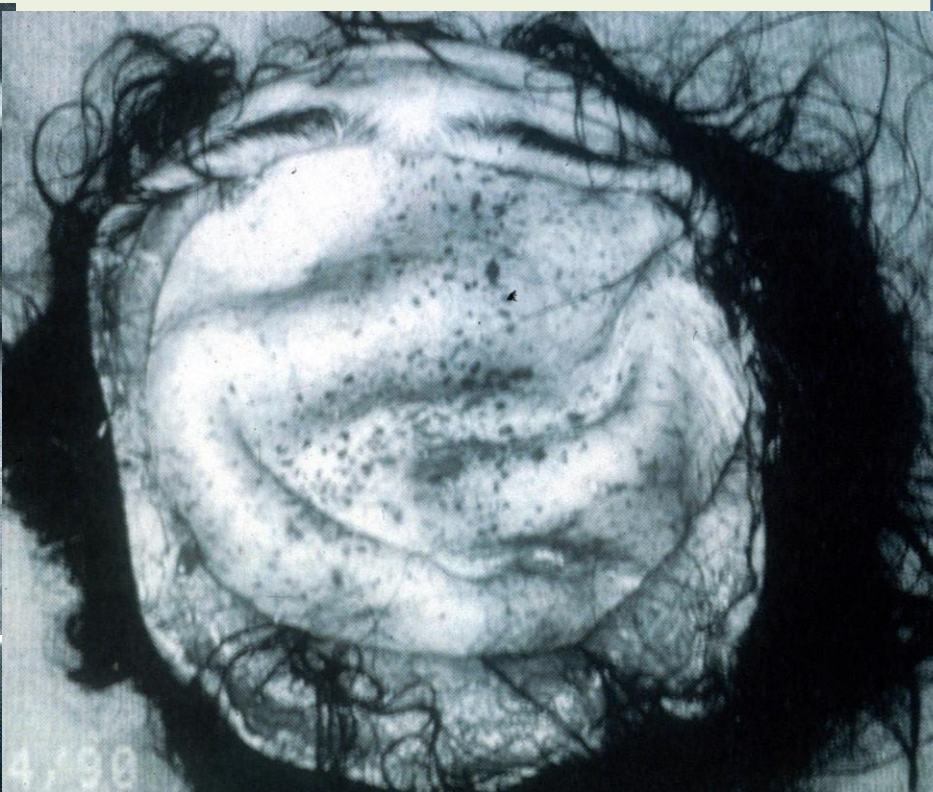
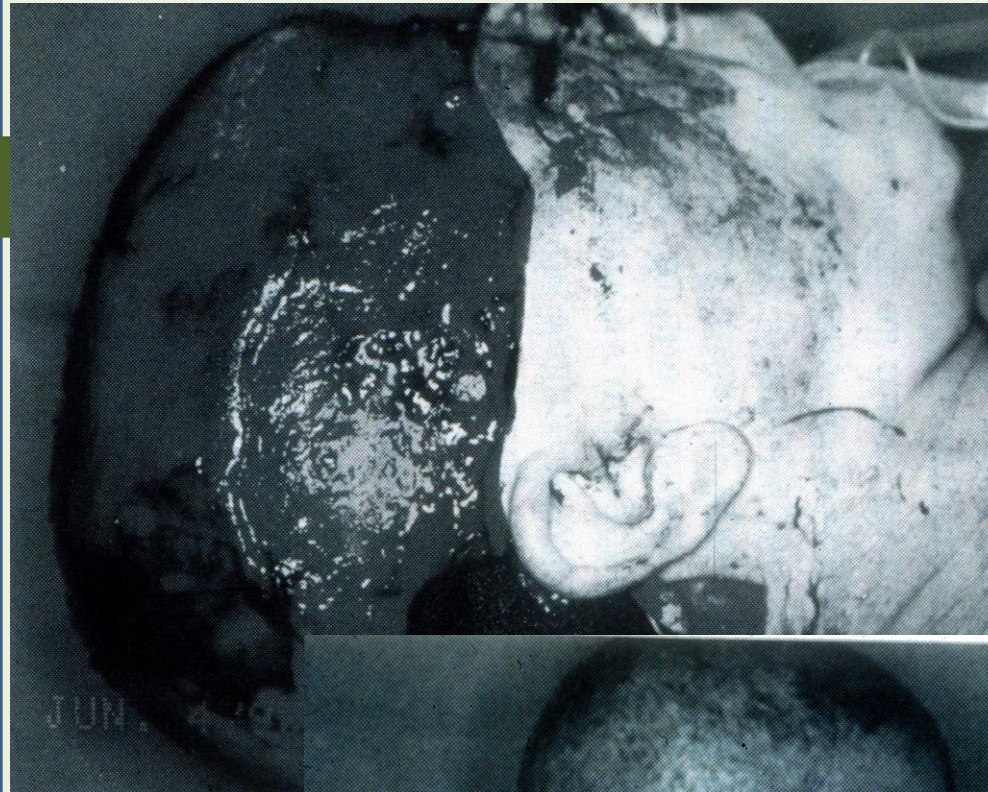




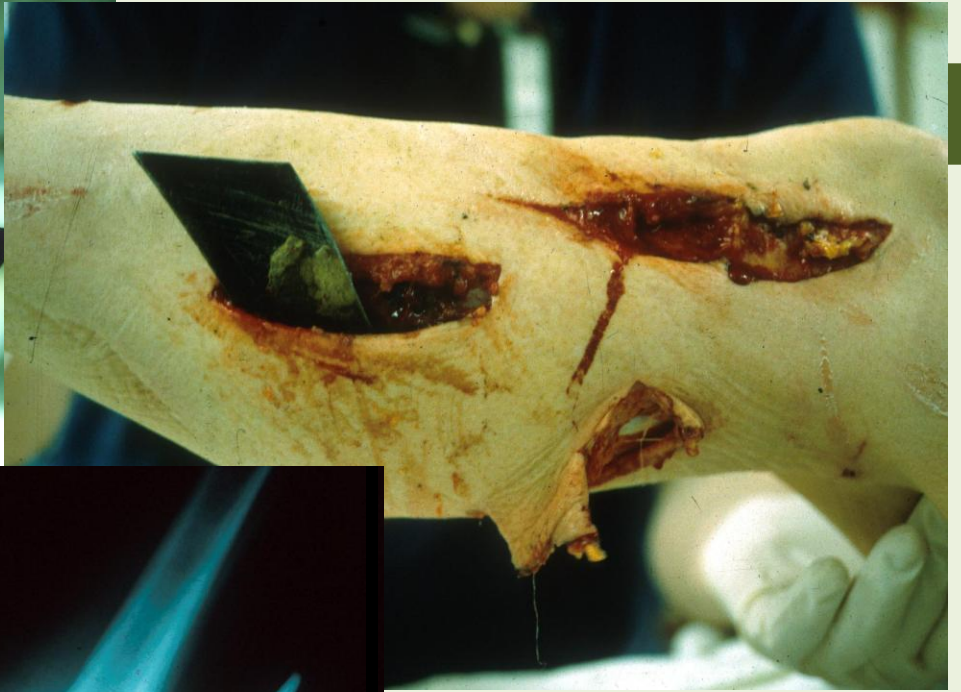
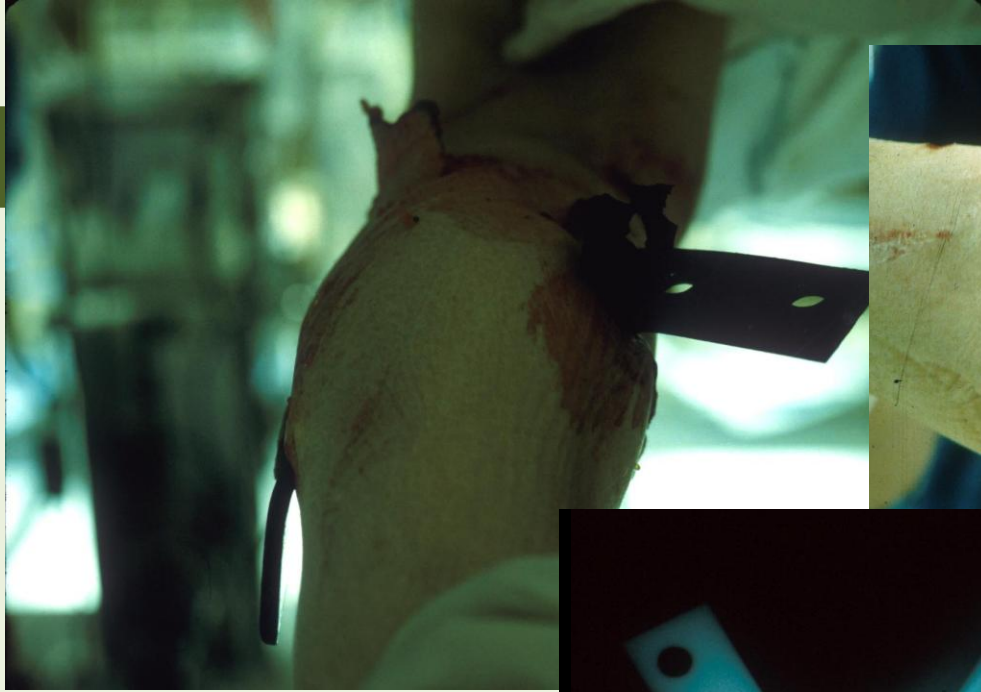












Summary

- Tremendous opportunity for “unique” farm emergencies.
- Bad ones will summon emergency services.
- The expectation is things will be better as a result.
- Response to agricultural related incidents will require a multi-disciplined / multi-agency response...

Discussion/Questions



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Discussion/Questions

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