


Introduction to Agricultural Emergencies

Module 1



RURAL FIREFIGHTERS DELIVERING AGRICULTURE SAFETY & HEALTH

1

Course Goals

Raise awareness among emergency service personnel (fire, rescue, EMS, police) about the many hazards on farms.

Identify ways to better prepare for, respond to, and manage on-farm emergencies.





© 2016 RF-DASH

2

Terminal Objective

Understand the importance of a well-coordinated Incident Command System (ICS) at agricultural incidents.



© 2016 RF-DASH

3

Specific Objectives:

- List five hazards that might be encountered on a farm in their community
- Understand why ag emergencies “low-frequency, high-risk” and how that impacts training/preparedness
- List three typical farm confined spaces



© 2016 RF-DASH

4

Specific Objectives:

- List three 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 emergency involving farm machinery, chemicals, structures, or animals



© 2016 RF-DASH

5

The Agricultural Industry



6

Agricultural Industry

- 1.89 million U.S. farms¹
 - 879 million acres
 - Avg. farm size = 464 acres
- Market value of U.S. agricultural products sold = \$389 billion²
- Full-time production ag workers in the U.S. = 2.1 million³
- 189,874 Canadian farms⁴
 - 153 million acres (62 million hectares)



Sources: ¹USDA ERS, *Farms and Land in Farms: 2022 Summary* (Feb. 2024); ²2017 US Census of Agriculture; ³<https://www.be.gov/ocpross/13.htm>; ⁴<https://agriculture.canada.ca/en/sectors/overview>
© 2016 RF-DASH

7

The Challenges of Today's Farmers/Ranchers





8

Increasing Production Costs vs. Stagnant Farm Income

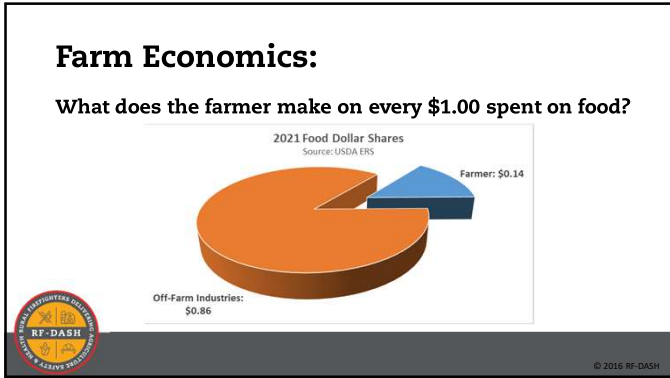
Rising equipment costs.
Higher operating costs.

Result:
Farmers must produce more and sell more to stay profitable.



© 2016 RF-DASH



9




10

New Technology Demands

Necessary to be efficient.
Expensive to implement.



Result:
Farmers must constantly modify their operations.



© 2016 RF-DASH

11

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



Result:
Farmers struggle to "keep up."



© 2016 RF-DASH

12

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.



© 2016 RF-DASH

13

Consumer Expectations

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



Result:
Increased demands on farmers' capabilities.



© 2016 RF-DASH

14

Other Concerns:

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



Result:
Increased risks to the farmer.



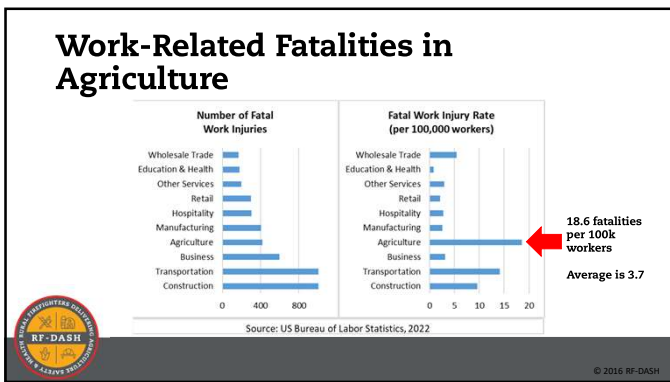
© 2016 RF-DASH

15

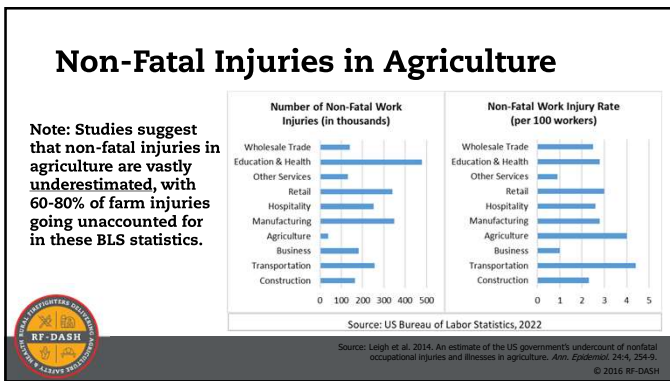
Agricultural Incidents: An Overview



16



17



18

Major Causes of Death & Injury:

- Tractor rollover - side & rear
 - More than half of all fatalities
- Tractor run over
- Roadway crashes
- Machinery entanglements
 - PTO, auger
- Animals



© 2016 RF-DASH

19

The “Who” of Agricultural Incidents

- In 2022, 36% of fatalities in agriculture involved workers aged 65+ years.¹
- Child dies in ag incident every 3 days; 33 children injured in ag incidents each day.²
 - Ag youth worker fatalities > all other industries combined over the last decade.
 - 78% of youth injured on farms are not working.
- From 2015-2019, ~60k people were treated in emergency rooms for nonfatal ag incidents.³
 - 30% = aged 0-17
 - 20% = aged 65+



Sources: ¹US BLS, *Census of Fatal Occupational Injuries: 2022*; ²NCORAHS 2022 Fact Sheet – Childhood Agricultural Injuries; ³Gorucu et al. 2022, *Nonfatal Agricultural Injuries Treated in Emergency Departments: 2015-2019*. *J. Agromedicine* 27(1), 41-50.

© 2016 RF-DASH

20

Farm Injuries & Fatalities are Costly...

- 7 in 10 farms go out of business within five years of a tractor rollover fatality.¹
- Community cost of a farmer's death is ~\$900k²
- Cost of farm incidents grow to 10x initial damage³
- Non-fatal injuries can lead to hospitalizations, long recoveries, or permanent disabilities
 - Increased likelihood of youth exposure
 - Increased stress for farm family

Word from the Field
“They’ve got millions of dollars tied up in their operation, so we got to treat them like a business. Let’s take care of them so if they do have an accident or a fire we can help them get back on their feet. At least mitigate it quickly and with as little damage as we can and life safety, of course, is always the important thing.”
 -RF-DASH Trainee





¹<https://extension.psu.edu/farm-safety-investing-in-farm-sustainability>; ²University of Missouri Extension, *Farming: The Most Dangerous Job in the US*; ³<https://www.midwestfarmreport.com/2023/09/20/farm-accidents-cost-more-than-initial-price-tag/>

© 2016 RF-DASH

21

Farm Incidents

- Farms are complex, dangerous, dynamic
- Low frequency, high risk incidents
 - Dearth of coverage fire/EMS curriculum
 - Relatively unfamiliar → time compression (prevention efforts can de-compress!)



© 2016 RF-DASH

22

We are trained to deal with this...



© 2016 RF-DASH

23

But can we deal with this???



© 2016 RF-DASH

24

Tractor Roll-Over

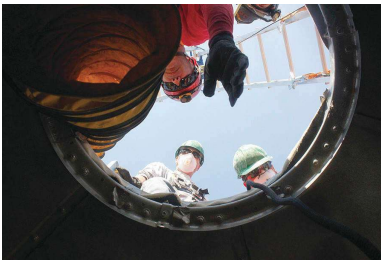


Please note: The photo is from an ag rescue training event. The 'victim' is a dummy.



25

Grain Bin Entrapment



26

Agricultural Hazards in Your Community:

- Unique hazards and challenges (don't become the patient)
 - Animals
 - Tractors & machinery
 - Chemicals and fuels
 - Confined spaces
 - Dispersed structures
 - Unique structures
 - Manure lagoons
 - Large operations
 - Questionably maintained roads and bridges
 - Criminal activity / agro- or eco-terrorism

Low rates of farm familiarity among fire/EMS



© 2016 RF-DASH

27

Agricultural Hazards



28

Tractors and Machinery





© 2016 RF-DASH

29

Sampling of 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

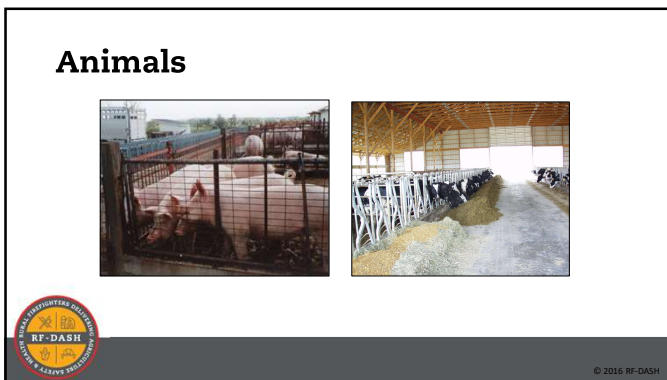


© 2016 RF-DASH

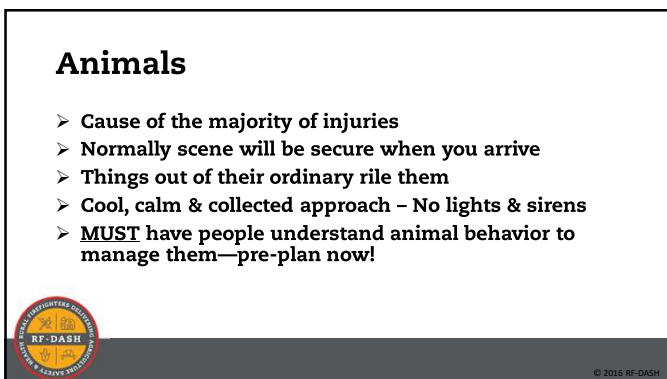
30



31



32



33

Handling Animals

Fires Incidents





© 2016 RF-DASH

34

Handling Animals

Flooding



© 2016 RF-DASH

35

Handling Animals

Animal Rescues



© 2016 RF-DASH

36

Handling Animals

Building Collapses



© 2016 RF-DASH

37

Chemicals





© 2016 RF-DASH

38

Chemicals

- Seasonal
- Concentrated vs. diluted
 - Ex. 1 pint to 30 gallons of water
- Stay upwind, out of materials



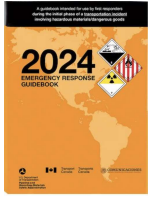


© 2016 RF-DASH

39

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.



© 2016 RF-DASH




40



© 2016 RF-DASH

41

Farm Chemical Storage



© 2016 RF-DASH

42

Structures




© 2016 RF-DASH

43

Structures

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



© 2016 RF-DASH

44

Farm Confined Spaces



© 2016 RF-DASH

45

Farm Shop



© 2016 RF-DASH

46

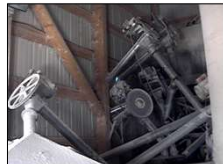
Animal Housing



© 2016 RF-DASH

47

Feed/Commodity Storage



© 2016 RF-DASH

48

Manure Storage



© 2016 RF-DASH

49

Utilites



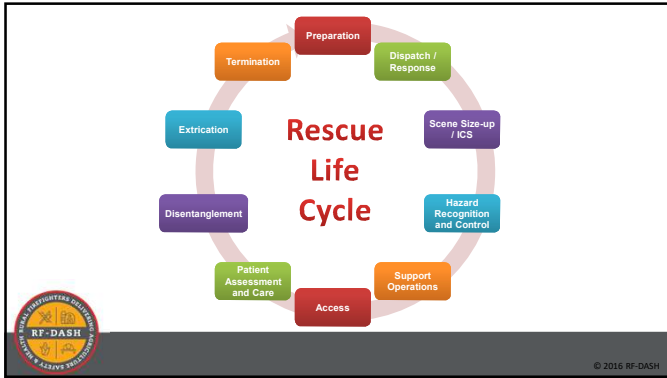
© 2016 RF-DASH

50

Agricultural Incidents: Emergency Response



51



52

1. Preparation

- Training
- Education
- Pre-planning / Pre-incident plan
- SOP/SOG development
- Tool and equipment maintenance
- Apparatus and personnel readiness

The slide includes the RF-DASH logo and the text "© 2016 RF-DASH".

53

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 Firefighter Line Of Duty Deaths occur responding to, or returning from, calls.**

The slide includes the RF-DASH logo and the text "© 2016 RF-DASH".

54

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




© 2016 RF-DASH

55

4. Hazard Recognition and Control of Risks

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




© 2016 RF-DASH

56

5. Support Operations

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




© 2016 RF-DASH

57

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



© 2016 RF-DASH

58

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.



© 2016 RF-DASH

59

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.)



© 2016 RF-DASH

60

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!



© 2016 RF-DASH

61

10. Termination

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



© 2016 RF-DASH

62

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?*



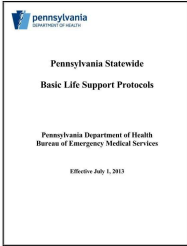
© 2016 RF-DASH

63

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?



Pennsylvania Statewide
Basic Life Support Protocols

Pennsylvania Department of Health
Bureau of Emergency Medical Services

Effective July 1, 2013




© 2016 RF-DASH

64

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



© 2016 RF-DASH

65

Questions?

- Connect with us!
- 1-800-662-6900
- nfmcs@mcfr.mfldclin.edu



@FarmMedicine
@nccrahs
@umash_umn



National Farm Medicine Center
UMASH
Upper Merion Medical Library and Health Center



© 2016 RF-DASH

66
